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ABSTRACT

This book, which contains the proceedings of the first in a series of annual Policy Forums on Employability Development conducted by the National Center for Research in Vocational Education, is an examination of the contributions of the key training institutions in the United States to the preparation of young workers for work. Focusing on preparation for jobs that require less than a college education, the book is intended to provide policymakers with information that will enable them to make more informed decisions about this country's employability training system. The book contains reports on the key structures and opportunities for employability development in this country, including public vocational education, the apprenticeship system, job training in the military, and training offered by proprietary schools. Other papers address the social, economic, and educational context within which employability development is provided. Policy implications and recommendations are presented based on the papers and the discussion that surrounded them at the Policy Forum. (KC)

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JOB TRAINING FOR YOUTH

The Contributions of the United States Employability Development System

Robert E. Taylor
Howard Rosen
Frank C. Pratzner
Editors

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The National Center for Research in Vocational Education
The Ohio State University
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1982

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U.S. Department of Education
National Institute of Education

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Preface

This book represents the first attempt to examine comprehensively the contributions of this country's key training institutions to the preparation of young workers for the world of work. It is a report of the proceedings of the first in a series of annual Policy Forums on Employability Development. The Forums, part of a larger research program being conducted by the National Center under the sponsorship of the National Institute of Education, are intended to provide policymakers with information that will enable them to make more informed decisions about this nation's employability training system.

Unemployment and severe problems of employment and training are not temporary phenomena. Inadequate education and training, discrimination, differential birthrates, the decentralization of industry, and the migration of skilled workers to new job sites will continue to leave our cities with hardcore problems of unemployment and training. Further, isolated rural areas will need assistance. Additionally, there are unique employment problems associated with displaced workers, new entrants into the labor market, the economically disadvantaged, women, the handicapped, and others.

The challenge of reindustrialization and national defense also has strong implications for employability and training. New production methods and equipment using more advanced technology are needed on a broad scale to enable American manufacturers to compete with foreign producers. The United States has suffered a declining productivity rate partly because of the lack of investment in technological innovations, new plants and equipment, and inadequate skill training. Greater effort must be made to develop workers who can use and maintain the high technology of the future. In addition to training workers who can use the latest equipment, we must also retrain workers who are displaced because of technological innovations and shifting industrial demands.

When one examines the organizations involved in the training of young workers for jobs below the professional level in the United States, one is immediately struck by the diversity of institutions. Among those institutions are private employers, public and private vocational schools, and the federal government, both in a civilian and military capacity.

These training institutions do not constitute a *training system*. There is no orderly combination or arrangement of these institutions as parts or elements of a whole. Training programs seem to follow different paths—directed toward different students, different employers, different funding sources, and different organizational structures.

Diversity of training institutions may be a rational approach in a pluralistic economy such as ours. Although such diversity is important and should remain as a continuing aspect of American employment policy, it is also clear that better articulation, better specialization and division of labor, and better communication among training institutions ought to be effected.

Because of the diversity of the training institutions and the lack of coordination among these institutions, we have inadequate information about the supply of skilled workers. For example, the lack of information about the number of trained workers released from the military who apply their skills in the civilian labor force combined with the absence of information about the large amount of occupational training conducted by private industry leaves a tremendous gap in our data base about the supply of skilled workers in the United States. In addition to a weak information base about the supply of labor, as a nation we have not been too successful in projecting the demand for skilled occupational groups of workers.

The question of increased coordination among employment and training programs is one of the most important issues we face today. It is therefore crucial that policymakers have a heightened consciousness and awareness of the various training delivery systems and the unique contribution they make to America's human resource development.

To guide such an effort, we have formulated what we call the federal macropolicy question, which is stated as follows: "*What agencies best prepare which individuals, for what kinds of occupations, under what conditions, with what effects, at what stage of their lives?*"

It is clear that we need to know a great deal more about the contributions of each of the employability training institutions, the clients they serve, the kinds of occupations for which they provide preparation, and the relative success of the people they train. Additionally, we need to have a better understanding of how these institutions interact and the manner in which they aid various individuals at different life stages.

Because of technological innovations, rapid changes in the economy, and shifting industries that affect occupational demand, the entire training and employability system needs constant updating, upgrading, redirection, and expansion. These are national problems, not just state or regional, and they call for efforts on a national scale if they are going to be dealt with effectively.

This Forum represents a first effort to take a total view of the diverse institutions involved in a common objective: the training of workers who need less than college training for the performance of jobs required by our complex economy.

The first Forum examined several of the key training institutions that provide skills for our young workers. The basic theme of the Forum revolved around the following question: What are the strengths that each training system has for developing job skills for different types of youths? A subsidiary theme was the coordination needed among the different training systems and the world of work. Another theme was the special contribution each training system makes in preparing disadvantaged youths with job skills necessary for successful participation in the work force.

The National Center organized this Forum to bring to the attention of policymakers problems and issues affecting training programs. In addition to presenting current policy issues, the National Center looked for suggestions for future forums in anticipation of emerging problems that may affect the training of our labor force.

This book will contribute to the continuation of thoughtful dialogue and debate leading to policies and practices that increase our capacity to provide an articulated, equitable, youth employability development service system. We hope to continue to contribute to that dialogue through this series of annual Policy Forums and reports.

As editors, we have taken minor liberties in preparing the materials for this volume. In particular, in chapter 2 we attempt to summarize our sense of the policy implications and recommendations growing out of the Forum. We take full responsibility for these interpretations and conclusions.

A great many people have contributed in a variety of ways to the first annual Policy Forum and to preparation of this first report. We wish especially to express our appreciation to Dr. Thomas Carroll, the National Institute of Education institutional monitor, for his support of the research program on employability development of which this Forum is a part, and to the National Institute of Education for funding this effort.

Columbus, Ohio
December 1981

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Overview

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1

Introduction: Job Training for Youth

Virtually no problem facing the nation today is more important than that of youth unemployment. Among the unemployed, none have experienced higher rates of unemployment than youth between the ages of sixteen and twenty-four. Too many young men and women are unemployed or underemployed, and the consequences of their unemployment are not consistent with this society's social and economic values.

Certain young workers have had consistent problems in entering the world of work and becoming self-supporting members of our society. Although neither the exact magnitude of nor the reasons for this high rate of youth unemployment are well understood, it is clear that those youth who are hit the hardest are from low-income families, are members of minority groups, or live in areas with high concentrations of low-income families (NCEP 1979).

Our major educational, training, and social institutions have met the needs of most youth reasonably well. However, these institutions have not succeeded in educating, training, or socializing a small but significant number of young adults. Although the magnitude of new young labor market entrants may decline in the next decade, the group of young workers who have the most difficulty will increase.

Young workers can successfully make the transition from school to work only if the labor market agencies and educational agencies are more effectively linked and involved in joint efforts. However, this is an enormously complex problem because the important function of providing the nation's labor force with the skills and training needed to perform the jobs required by our complex economy is carried out by a diverse and essentially independent array of institutions, agencies, and programs. Included among the array of formal and informal institutions that provide skills and training for workers are such key agencies as public vocational education, apprenticeships, on-the-job training offered by trade unions, and business, and government programs such as those provided through CETA and the Job Corps.

Collectively, these and other agencies and programs are a very large enterprise, spending many billions of dollars annually. They differ fundamentally in their purposes—which range from correcting early socialization gaps to increasing profit margins. Their strategies range from traditional classroom practices to on-the-job training. The competencies they focus upon range from literacy skills to technical skill proficiency in entry-level jobs, to personal development and work socialization. Their organizational structures range from labyrinths of federal, state, and local bureaucracies to small entrepreneurial operations.

This great diversity among sectors or agencies is also apparent within sectors, and no single agency or actor represents an entire sector. Thus, for example, public vocational education is not a monolithic program. It varies by state and locality. CETA provides different programs and services through a variety of mechanisms at the prime sponsor level. Apprenticeship programs differ substantially by trade and locations.

Such diversity in programs and services is not necessarily bad. It can contribute to the broader goal of providing multiple service deliverers at the local level so that youth will have options that meet their specific developmental and employment needs. But much of the potential value of this diversity may be lost because of the independence with which they operate and the apparent lack of models, incentives, or mandates for effective collaboration, cooperation, or linkage. For example, most of the publicly supported programs are based on different federal legislation; none of the privately operated programs have requirements or mandates to coordinate their services with other deliverers; some programs compete with each other in providing services for particular subpopulations of learners, whereas other groups seem to be largely ignored by most sectors; some focus more on preparation for entering employment, whereas others are primarily concerned with maintenance and advancement in employment; some are supported directly with federal, state, and local tax dollars, some are privately supported, and some depend on their clients for support; some have a lot to say about their choice of clients, others have little to say; some offer a broad array of programs and services, others greatly restrict their offerings. Moreover, they do not appear to share a common philosophy regarding the process of employability development.

Because these diverse agencies and programs have not been viewed, by themselves or others, as an "articulated system" for preparation for work, there has been little coordination or collaboration in their policies, practices, or services. Although it is abundantly evident that this collection of agencies and institutions is not and can never be a monolithic entity subject to control or major redirection through public policy—in fact, such a prospect is inconsistent with our democratic values and our national ethos toward free enterprise—it is, nevertheless, necessary to understand how they function if this country is to provide a more efficient, equitable, and integrated youth service system.

A first step toward achieving a more articulated employability development system is an examination of how the various youth training institutions prepare young workers for the labor force and whom they serve. It was for this reason that the National Center initiated its series of annual policy forums.

The first Policy Forum was held on October 14-16, 1981, at the National Center for Research in Vocational Education, at The Ohio State University in Columbus, Ohio. The Forum was attended by approximately seventy participants representative of training in industry, military training, apprenticeship, public and private vocational education, government training programs, and policymakers. A group of experts was asked to prepare papers describing the key training systems. Each session of the Forum focused primarily on a particular training system. After the authors presented their papers, reactors offered critiques, and open discussion involving the participants then followed. The papers by Dr. Ray Marshall and Dr. Robert M. Worthington were each presented as keynote addresses at evening banquets.

In chapter 2, we attempt to summarize the explicit and implicit policy recommendations gleaned from the papers and dialogue related to each of the key training institutions. It is our hope that this summary will not only convey a sense of the nature and excitement of the dialogue at the Policy Forum, but that it also will be useful to policymakers,

researchers, scholars, practitioners, and students concerned about increasing our national capacity to provide efficient and equitable employment development for all youth.

Subsequent chapters present the substantive papers and the comments of the reactors.

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ROBERT TAYLOR, HOWARD ROSEN, FRANK PRATZNER

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Summary of Policy Recommendations

One of the main objectives of the first annual Policy Forum on Employability Development was to suggest policy directions for the training of noncollege-bound young workers. The following policy recommendations were derived from the papers presented at the Forum or from the discussions that followed each presentation.

POLICY RECOMMENDATION I

The primary purpose of federal employment and training policy should be the enhancement and development of human resources. At the present time, there is no comprehensive human resource development policy for public and private involvement in education and training of workers, nor is there a coordinated system for providing such training. The formulation of public policies to promote the effective development and use of human resources is hindered by a lack of knowledge about the current structure of education and training opportunities for work and how well this structure serves the needs of individuals and the needs of the labor market.

To move toward a more comprehensive and coherent human resource policy, it is recommended that, in the legislative reauthorization process for various federal employment and training programs, attention be given to expanding the provisions for research, development, evaluation, and policy studies. Such provisions would enable us to better understand not only the individual delivery systems and their relative success, but also their interaction, coordination, and articulation.

Limited R&D dollars are now focused on the categorical dimensions of individual delivery systems. These resources also need to address broad questions that cut across the full range of institutions and the interactions of these subsystems.

POLICY RECOMMENDATION II

Current evidence suggests that there are pockets of coordination and articulation randomly occurring among the diverse elements of the employability development system. For example, some coordination is taking place between vocational education and apprenticeship programs, and there are good examples of CETA and vocational education coordination. But these instances of coordination are largely a function of local or state staff initiative, and they do not reflect a conscious national effort at integration.

Explicit provisions are needed within federal legislation to facilitate coordination and articulation *across the total system.* Experience suggests that such coordination requires continual research, development of common data bases, establishment of information clearinghouse services, dissemination of new ideas and practices, and the continual updating of instructional materials, equipment, and training personnel.

Other factors that federal legislative language can address to facilitate coordination and articulation across training institutions include: adequate incentives, similar fiscal years, common definitions, shared advisory committees, similar accountability systems, and joint funding and shared activities across federal and state agencies. It is also important that there be similar organizational structures with respect to the levels of local and state administration to facilitate articulation.

POLICY RECOMMENDATION III

Forum participants emphasized how little is known about training in American business and industry. Although more effort is apparently expended by business and industry on the training of currently employed managers and supervisors than on blue-collar workers, both the authors and Forum participants acknowledged that little is known about the costs of training either managers or blue-collar workers, the number of workers being trained, the kinds of skills and occupations for which training is provided, and why some companies train and others do not.

As a society concerned about international competition, productivity, economic growth, and inflation, we need to know more about the extent and quality of job training activities in the private sector. Considerably more research effort should be directed toward developing information about private sector involvement in the training of the American work force.

POLICY RECOMMENDATION IV

American business and industry seem to be entering a period of accelerated technological change that will affect the demand for certain skills on the factory floor and in offices. These changes should increase the need for a closer relationship among educational and training institutions, trade unions, and employers.

One of the most significant developments of the past decade has been the creation of industry-education councils that are designed to involve employers, labor representatives, and educators in establishing priorities and directions for local training activities. Unfortunately, the efforts to bring schools into better alignment have often been conducted on a fragmented, duplicative, and uncoordinated basis.

There is a definite need for local commitment by the employing community and the educational establishment to the long-term training needs of our youthful population. However, a single umbrella organization is needed if the proliferation of uncoordinated activities by these councils are to be avoided. Forthcoming national and state legislation concerning employment and training should specify an overall institution to coordinate the work of state and local industry-work organizations.

POLICY RECOMMENDATION V

Management and labor should be encouraged to participate in "joint ventures" with local training institutions and universities to provide education and skills to the employed labor force. Business and industry should make greater use of local universities and technical schools to provide teachers who can offer their training skills to companies as well as to external educational and training programs. Local educational institutions should be encouraged to provide practical training by such means as using industry specialists as resource persons.

POLICY RECOMMENDATION VI

Learning is a lifetime process that should be encouraged even after the worker is employed. Employers need to think of their labor force as a long-term resource that can be improved and developed. Assuming that management wants to act in the interest of efficiency in dealing with its work force, training should be encouraged and expenditures should be considered as long-term investments rather than as part of a single year profit-and-loss statement.

POLICY RECOMMENDATION VII

Greater attention should be paid to the possible use of apprenticeship programs for the training of teenagers to test whether they can reduce teenage unemployment.

Apprenticeship represents both a job and a training slot. As it now operates, it is a relatively small but significant part of the training system for noncollege-bound youth. Although it is not a teenage program in the United States and is not used as a device for easing the transition from school to work, expansion of the system to include younger workers may contribute to the reduction of youth unemployment.

Because of the advantages of apprenticeship training to individual workers, employers, and to society in general, consideration should be given to developing ways for expanding apprenticeship in the more rapidly growing sectors of the economy such as the electronics or health fields, which need highly skilled and technical workers.

POLICY RECOMMENDATION VIII

The federal government plays a limited role in promoting, supporting, and regulating apprenticeship programs. However, because of the apparent persistence of discrimination in the field of training, the federal government still needs to play an important role in enabling blacks and other minorities to gain access to apprenticeship and other training opportunities. Longitudinal studies of how black craft workers acquire their skills indicate that discrimination still persists in gaining access to training programs.

POLICY RECOMMENDATION IX

American blue-collar workers represent a key ingredient in the training of the labor force. Many workers select and pay for their own training in order to become upwardly mobile. They are resourceful in using our diversified training institutions for acquiring job skills. Some workers use formal training programs such as vocational education schools and apprenticeship programs for learning skills. Others pick up their skills informally by exposure to a variety of job experiences. The government should make a more intensive effort to encourage blue-collar workers to take advantage of available tax benefits for all types of skill training.

POLICY RECOMMENDATION X

Over the years, the vocational education system has been called upon to respond to changing national priorities and federal objectives with appropriated federal funds far below authorization levels. If vocational education is to adjust to rapid social and technological change and achieve its full potential for contributing to increased equity for disadvantaged workers, reduction of inflation, elimination of skill bottlenecks, and improvement of productivity, a variety of incentives and techniques should be explored.

Federal funds for vocational education now being expended for maintaining existing programs should be increased to their full authorization levels and should be used to test innovative training techniques and to improve current programs. Consideration also should be given to the establishment of a new title in the reauthorization of the Vocational Education Act that would concentrate on developing new techniques for achieving a closer tie between the vocational education system and the productivity of the American labor force.

POLICY RECOMMENDATION XI

The vocational education system needs to establish its own national longitudinal survey to provide statistically valid impact data about the long-term effects of its training programs. The proposed longitudinal survey should provide detailed, valid data on types and amounts of vocational training taken and the labor market experience of vocational education graduates.

POLICY RECOMMENDATION XII

Several pioneering efforts have demonstrated that women can perform effectively in nontraditional occupations. More women need to be encouraged to acquire skills that will enable them to move into occupations traditionally dominated by men. Counseling that exposes women to the opportunities available in higher-paying nontraditional jobs should begin in the home and continue to be emphasized throughout the educational system. The increasing number of female-headed families makes it more important for greater numbers of women to become self-supporting if they are to provide adequate shelter, food, and clothing for their children. More attention needs to be paid to the enrollment of women in high-quality nontraditional job training.

POLICY RECOMMENDATION XIII

The demographic changes of the next decade will not improve the employability problems of minority youths. Whereas the absolute and proportionate number of white youths in our labor force will decrease, black and other minority youths will increase as a proportion of the total. If the current educational system cannot improve its training of minority youths, the need for a second chance system such as the Comprehensive Employment and Training Act (CETA) will continue throughout the 1980s.

Although CETA made an important contribution in providing skill training for minority youths, the system needs to be restructured. Too many youths entered programs because of stipend incentives rather than interest in acquiring skills. A few of the youth programs were unstructured and poorly supervised and may have had a negative impact on the participants.

The successful elements of the CETA program should be preserved. There is a need for improved national leadership in the CETA system to coordinate the sharing of what has been learned by prime sponsors in conducting training programs, and youth models should be offered to prime sponsors so that they can be adapted to local needs.

POLICY RECOMMENDATION XIV

Many of the innovations of the Job Corps have the potential for transferability to larger CETA youth models. The Job Corps is the most integrated and coordinated program under CETA. Its remedial services have been effective in dealing with some of the most disadvantaged youth in our society. The Job Corps experience points up the need for better linkages for recruitment and placement between the nationally operated program and local prime sponsors.

POLICY RECOMMENDATION XV

Private proprietary schools appear to have made significant contributions to the skill needs of the American labor force. However, there is surprisingly little information available on the characteristics of the students, student motivations, and the cost-effectiveness of their programs. Both the proprietary schools and the scholars interested in the training of our work force should concentrate more of their research efforts on the activities of these training institutions.

Proprietary schools should strengthen their self-regulating associations and accrediting commissions in order to improve their programs and standards. To improve their training of the disadvantaged youth population, other job training institutions should examine how proprietary schools have made their programs sensitive to the needs of their students and employers, developed flexible teaching schedules, and concentrated on job placement.

POLICY RECOMMENDATION XVI

More research is needed on the impact of military training on youth employment and occupational choice. Both the U.S. Department of Defense and the U.S. Department of Labor should continue to fund the new National Longitudinal Survey. This survey will provide data comparing the labor force experience of youths with similar characteristics who receive training in the military to youths who are trained in the civilian sector. Additionally, greater coordination should be developed at the federal level between the U.S. Department of Education and the U.S. Department of Defense in providing skill training to American youth.

Better integration is needed between civilian social and rehabilitation agencies and military institutions in order to determine the extent to which the military can help disadvantaged youth. Mechanisms should be developed for greater sharing of training concepts, curriculum, educational techniques, and technologies between civilian and military training institutions.

RAY MARSHALL

3

Youth Employability: The Social and Economic Context

INTRODUCTION

Discussing the social and economic context for employability development during the 1980s and 1990s is a difficult assignment even in times of relative stability, but it is particularly hazardous now because the United States and world economies are in a state of ferment. Forecasts usually are difficult to make because of unpredictable events, but now there is no consensus on the causes of *present* problems; and there is even less consensus on the solutions to such important national problems as unemployment, inflation, declining growth in productivity, and the loss of competitiveness of American industry.

There nonetheless are some economic and labor force trends that seem to be sufficiently deeply entrenched to make it safe to project them into the future.

It is fairly clear that *work place issues* will be the focus of national and international attention throughout the rest of this century. For one thing, with the growing labor force participation of women, work is becoming more important in the lives of most adults. Indeed, it is our main unifying experience, is the way most adults identify themselves, and is the main way they gain—or fail to gain—self-fulfillment. Despite talk of a demise of the work ethic, there is a strong desire (as well as necessity) for people to work. Indeed, this desire is so strong that the availability of jobs attracts so many people into the work force that we have to create two or three jobs in order to reduce unemployment by one. I believe the desire to work will produce strong support for full employment policies during this decade—especially when the futility of attempting to solve supply-induced inflation with unemployment and reduced real output becomes more obvious.

The work place issues will be important because people not only demand more jobs, they also demand *better* jobs and especially safe and healthful work places with greater worker participation in making the work rules. The polls show that the trend toward increased worker participation and concern about the quality of the work environment that has swept Western Europe also is strong in the United States. Participation in America has not and probably will not take the form of laws requiring worker participation on boards of directors and work councils, but collective bargaining and other forms of worker participation will become increasingly important. For example, work place safety and health protection could be greatly strengthened by supplementing traditional regulatory activities with labor-management safety and health committees.

It is fairly clear that the solution to many of our most important economic problems will require greater attention to work place improvements. The problems of inflation, declining economic and productivity growth, and unemployment all will require work place solutions. The central assumption undergirding many of our economic policies is that most of our problems are caused by the need to market the output of a productive system. During the last fifteen years, especially during the last ten, it has become clear that we also have serious production problems. These are mainly work place problems, but they influence, and are influenced by, general economic conditions. We, therefore, probably will see intensified efforts to link *micro-* and *macro*economic policies through industrial relations systems. The tension between changing and diverse work forces and jobs will focus attention on the work place as a source of conflict. Some of the main *economic and social trends influencing employability development* follow.

THE INTERNATIONALIZATION OF THE AMERICAN ECONOMY

International activities accounted for 9 percent of the Gross National Product (GNP) in 1950, whereas now they account for about 20 percent. This fact is indicated by a growing proportion of GNP in international trade and the growing penetration of American markets by foreign producers—though the interdependence has become such that it is difficult, if not impossible, to determine where manufactured products are made. It is easier with energy and other resources, which have dramatically underscored our economic interdependence.

There are several implications of internationalization. First, we have less control over our ability to develop jobs and employability. Jobs in the United States depend on developments in the *world economy*, over which we have *little control*—especially in a world characterized by stagflation—unless other economies expand simultaneously. Efforts to reflate the American economy by traditional means will be limited by inflation and increased imports of people and goods.

Second, the *internationalization of money supplies* also limits any nation's ability to follow *monetarist* policies to control inflation. Developments in information technology have accelerated internationalization.

Third, economic conditions in the United States also are influenced by the actions of *multinational corporations* (MNC). The MNC, as transmitter of international labor standards, could have profound positive or negative impacts on employability development and labor standards in the United States. The intensification of international competition already is changing work practices in the United States. It is hoped that superior conditions will predominate, but there is no assurance that they will. My guess is that those employment standards (whether unilateral, negotiated, or legislated) that are compatible with greater productivity and efficiency will prevail. Efforts also probably will be made to develop stronger international labor standards to prevent employers from acquiring competitive advantages by ignoring acceptable work practices.

Fourth, internationalization will affect labor supplies and working conditions in the United States. This is because the United States has taken twice as many immigrants and refugees in recent years as the rest of the world combined. A large but unspecified proportion of the recent growth in our work force has been from immigrants and refugees, probably half of whom enter the United States illegally. We have paid little attention to the labor market implications of our immigration policies, most of which have been based on humanitarian considerations even though most immigrants come here to work.

Since we probably will not take action to limit immigration, the enormous job pressures of the Third World will spill over into the United States. The developing countries will have to create 600 to 700 million jobs during the next two decades to keep unemployment from rising. The probability that they will experience this kind of employment growth is remote—there are not 600 to 700 million jobs in the industrialized world today. Illegal immigration perpetuates bad jobs, limits the job options of low-wage workers, and will make it much more difficult to reduce unemployment. I also believe we are likely to have serious civil rights problems in the future because of the disadvantages suffered by illegal immigrants and their children. These civil rights conflicts could have serious *international* implications.

Fifth and above all, internationalization will cause jobs to be subjected to the efficiency requirements of intensified international competition. The outcome of this process is not predetermined. Competition tends to generate more productive systems, but also creates counterforces to insulate domestic economies from the adverse consequences of competition. The outcome could be a reversion to protectionism or the formulation of international trade rules within which trade can be more open. Those who deny the need for fair rules or interpret those rules as "protectionist" will make it more difficult to avoid stronger protectionist sentiments, which could impair economic efficiency and growth.

UNEMPLOYMENT AND INFLATION

The main *economic trends* we face are high levels of unemployment and inflation, and declining growths in GNP and productivity. A major problem for the United States is the absence of consensus on either what caused these problems or what to do about them. It seems fairly clear to me that supply-side macroeconomics and monetarism will not solve these problems. Although it seems that the prescriptions of demand-side economists are more nearly correct, *no macroapproaches* alone will solve our economic problems. We must rely more heavily on a combination of monetary and fiscal policies, especially to achieve lower and more stable interest rates, but attention also must be paid to specific labor and product markets, and to the development of mechanisms to build consensus, coordinate policies, and ensure more attention to the long-run problems and greater continuity in policies to deal with those problems. We cannot revert to the policies of the past when our main economic problem was perceived to be general surplus of labor and products. Today's main economic problem is shortages, not surpluses, and there is more diversity within the economy and within a highly interdependent world. Today, our policies must be more specific and more concerned with efficiency, productivity, resources, and technology. I am convinced that whereas our policies have to be adapted to our institutions and conditions, we have more to learn from countries such as Germany and Japan than we do from countries such as the United Kingdom, where supply-side economics is receiving its most comprehensive trial.

DECLINING PRODUCTIVITY

The United States' declining rates of growth in both productivity and GNP will limit real income growth, restrict future job options, exacerbate internal conflicts, weaken our international competitiveness, and intensify inflationary pressures.

We do not fully understand all of the reasons for the decline in the growth of productivity, but improvements can and must be sought in *management* systems and work place *practices.*

Rising *unemployment* also will limit job options and exacerbate social problems, especially in the secondary labor markets. In fact, we are likely to see a widening of income gaps between workers in the primary and secondary labor markets. The incomes of workers who possess scarce technical skills will accelerate, whereas there will be limited gains by those in secondary labor markets. The concern about inflation will cause unemployment to be neglected by policymakers in the short run. Indeed, the conviction probably will grow that high levels of unemployment are necessary to limit inflationary pressures. But the futility of attempting to solve the inflation problem with rising unemployment will become clear by the middle of this decade. This will lead to greater attention to employment policy and more sensible ways to achieve price stability. The *desire for jobs is very strong* in all sections of the population and will grow during this decade, as will the realization that the solution to our problems will be found in increasing output and employment, not in limiting it.

DEMOGRAPHIC AND LABOR MARKET TRENDS

Some strong *demographic and labor market trends* will influence employability during this decade: one of these is the increased labor force participation of women—who will constitute two-thirds of the growth in the labor force during this decade. *This is perhaps the most important labor market trend of the century.* In 1950, 70 percent of American households were headed by men whose income was the sole source of family income; today only about 15 percent of families fit this "traditional" model, even though many of our employment policies assume it still to be the norm. This change has these profound implications:

1. Despite improvements, women remain heavily concentrated in traditional jobs. About 70 percent of all women are concentrated in forty-eight occupations where women constitute over 50 percent of the employees—40 percent of all women are in ten such occupations. There has been even *less progress* in narrowing sex earnings differentials. Women who work full time earn only about 59 percent as much as men who work full time. Affirmative action therefore will continue to be a major labor market issue during the 1980s.

2. *Job practices* and *family practices* will become closely related. The availability of such family-enhancing services as child-care facilities and maternity leave will have a strong impact on American families, and this in turn has a major significance for the development of children and other social concerns.

3. There is no evidence that the great increase in working mothers *per se* has had a negative impact on child rearing. However, the mothers' self-image and the families' economic and emotional well-being are heavily conditioned by the mothers' ability to work. Even though most women work for economic reasons, a paid job has become an important symbol of self-worth and personal independence for women. The mechanization of household work and increasing life expectancy have created much more time for women to pursue careers. Around 1900 the average life expectancy for a woman was forty-seven years, eighteen of which were spent childbearing; today, a woman's life expectancy is seventy-seven years, only ten of which are devoted to childbearing (though more are devoted to child rearing).

4. The *educational level of the work force has increased* significantly since World War II. Between 1966 and 1974, the number of people

receiving bachelor's degrees doubled and the number receiving master's and doctoral degrees increased almost as fast. This development has a number of implications:

- Increasing education (and training) has been responsible for *sustaining economic growth,* though at a diminishing rate in the 1970s.
- The higher levels of attainment intensify competition for the good jobs, placing those with limited education or training at a serious labor market disadvantage. Inadequate job opportunities for highly educated people could create serious social tensions in the United States, as has been the case in some other countries.
- Higher levels of education have reinforced other factors tending to change *traditional attitudes about work.* There is a strong demand for "good" jobs and a growing tendency to avoid marginal, disagreeable, low-wage jobs—a tendency that many use to justify the continuation of immigration to fill these positions as alternatives to *improving* those jobs or raising wages to attract workers.

More highly educated workers also are less tolerant of *authoritarian* work situations and wish to have greater *participation in job decisions.* Demand for participation has not reached the intensity in the United States that it has in Europe and Japan, where workers participate more at every level of management, but the desire for participation in Japan, Germany, and Scandinavia will undoubtedly intensify pressures for some forms of worker participation in the United States. The main form of participation in the United States undoubtedly will be an *extension of collective bargaining* to younger, better educated workers, and participation in government-mandated protective programs such as occupational safety and health, rather than participation on boards of directors or in work councils. However, the logic of the process, the widespread desire for greater participation by younger workers, and the pressures to improve productivity and efficiency are such that efforts will be made to increase worker participation in quality control and productivity improvement activities.

5. There have been some significant changes in the *age composition* of the work force and these will continue during the 1980s. Youth job pressures will be relieved somewhat by the fact that 4 million fewer sixteen- to twenty-four-year-olds will enter the work force. However,

the decline in young workers is almost entirely among whites; minorities will increase their proportion of sixteen- to twenty-four-year-old workers from *15.8 percent* in 1980 to *18.3 percent* in 1990.

Youth Employment

There are those who believe the youth employment problem will be greatly improved by the declining numbers of sixteen- to twenty-four-year-olds. I do not share this optimism. The *real* youth employment problem has been heavily concentrated among those young people with multiple disadvantages. There is *no evidence* that the numbers in this category will diminish. This group is comprised disproportionately of minorities, whose numbers will not decrease. Moreover, I doubt that we can gain control of illegal immigrants, who compete mainly in secondary labor markets. Unfortunately, programs that target resources to deprived workers probably will be reduced, at least for a while. This is unfortunate because we have learned some things about how to address the special problems of the severely disadvantaged, and the reduced total number of young people probably will make the problems of the seriously deprived more apparent. We have learned that these youths need longer, more intensive, and specialized attention at an early age. We also know that there must be close coordination between educational and labor market services and that youth employability programs must give greater attention to disciplined skill development and basic education. The problems of severely disadvantaged young people are not likely to be dissolved by declining numbers of young people and competitive market forces. In fact, the improvements for those who are relatively well off will make the problems of the severely disadvantaged appear relatively worse.

We also have learned other things:

1. The youth work force is not homogeneous—our ability to design effective programs will depend heavily on our ability to distinguish among different types of youth and youth programs.
2. Some unemployment is voluntary in this work force.
3. Even the severely disadvantaged are not a homogeneous category.
4. We must avoid evaluating programs against a standard of perfection.

We should expect that programs will not be perfect when we create them, but that they will evolve through trial and error, which happened, for example, within the Job Corps.

Other Age Groups

The most dramatic age composition change will be in the twenty-five- to forty-four-year age group, reflecting the aging of the postwar baby boom. In 1975, there were only *39 million* people in this category; *by 1990 there will be over 60 million.* This will greatly intensify job competition in this group, *which will constitute over half of the work force.* Intensified competition for jobs probably will make this group less supportive of affirmative action programs for women and minorities unless special efforts are made to gain their support.

Men fifty-five to sixty-four have been withdrawing from the work force, and a larger proportion of the population is over sixty-five. This will continue to strain pension funds and the social security system because the ratio of workers to nonworkers might continue to decline. In 1935 when the social security system was passed, there were eleven workers for each worker over sixty-five; today the ratio is three to one, and by 1990 it will be two to one. I expect these and other developments to contribute to a reassessment of attitudes about retirement and work with the consequence that more older people will be encouraged to work and will elect to do so.

CHANGE FROM MANUFACTURING TO SERVICE JOBS

There have been some important occupational trends away from goods production to services, especially *information* occupations, which were 15 percent of the jobs in 1950 but are 55 percent of the jobs today. The growth of information jobs has contributed to the decentralization of industry to rural areas and the Sun Belt and has reduced the size of producing units.

Rapidly changing information technology and intensified international competition have created serious *job problems in the industrial heartland,* especially for relatively high-wage union workers in basic industries. Minorities also have been heavily concentrated in these areas. These changes have an important impact on youth employment because manufacturing has in the past provided entry-level jobs for young people. The decline in manufacturing jobs and the growth of seniority and other practices to protect adult jobs has limited the jobs available to youth, who must therefore rely more heavily on low-wage service jobs where unemployment rates have been higher. In fact, locational factors have played an important role in the employment problems of minorities, who everywhere tend to live outside the areas of rapid job growth. Moreover, minorities tend to move to places where they have cultural or ethnic ties, or, in the case of illegal immigrants, where they have language and cultural "cover" to avoid detection, rather than to where job opportunities exist.

SUMMARY

All of these changes have caused work forces to be more diverse than they were thirty years ago. This diversity will lead to pressures to increase job options in order to meet workers' diverse needs, because *work forces* have changed more than *jobs*. As Clark Kerr (Kerr and Rosow 1979) has observed:

> The nontraditional worker, the educated worker, the mobile worker . . . lead to pressures for more variations [on the job]; to electives at the place of work as in the school; to special arrangements in the office—to options in work time, in retirement plans, in job tasks; to choices about when to work, when to learn, when to take leisure time, when to retire, rather than follow a set schedule; the multiple option society rather than the society of the common rule (p. xxvi).

The leadership challenge of the future will be to shape these dynamic, diverse trends and values into viable, efficient systems that will at the same time satisfy changing human needs for self-fulfillment. The challenge of youth unemployment is to provide adequate education, counseling, training, and motivation as well as to provide the opportunities. This will, in turn, require a high degree of coordination between educational, service, and labor market institutions concerned with the employability development of youth. We face some serious work place problems, but we also have some tremendous opportunities. Our task must be to generate the leadership, resources, and mechanisms to solve the problems and enhance the opportunities.

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ROBERT M. WORTHINGTON

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Youth Employability in the Context of the 1980's

I would like to congratulate Bob Taylor and the National Center for Research in Vocational Education for initiating this First Annual Forum on Employability Development, in which skilled work force developers of all persuasions might meet together to discuss common problems and to negotiate new directions toward which all concerned might jointly strive. As a firm believer in the need for coherent national leadership in skilled work force development, I suggest that the creation—finally—of a single plan for such leadership is the most significant potential outcome of this new forum series. In my view, joint policy development must precede actual employability development, if we are to avoid the "scatter-gun" strategy that has left all of us appearing, to the less informed, as somewhat less than adequate.

One of the reasons why I was so pleased to accept this assignment was the opportunity to talk to a high-level group that includes so many of my old friends and colleagues—such as Howard Rosen, Sar Levitan, Garth Mangum, Rupert Evans, and Byrl Shoemaker, the Dean of State Directors of Vocational Education in America—to name a few.

However, I must confess that the recital of these names gives me cause to think just how long we have been plying our trade and selling our wares, how many conferences we have attended that seem to cover the same subjects over and over again, and how many speeches we have made that are now almost committed to memory.

I do not suggest that we have all been traveling in circles, going nowhere. On the contrary, I am convinced that the "wares" we now sell show a much greater selection and are of higher quality than those of fifteen or twenty years ago. In a recent speech to state directors of vocational education in Snowbird, Utah, I had occasion to compare the present, far-flung vocational education delivery system with what I knew as Associate U.S. Commissioner of Education and head of the Bureau of Adult, Vocational, and Technical Education in the early 1970s. Since then, the growth in services and investment has been phenomenal. For example, we have seen an annual increase in the operating budget from $2.6 billion in 1972 to approximately $8 billion in 1981—most of this being state and local funds. Vocational education services are reaching far greater numbers of both youth and adults in this current year than was the case in 1972—and, although our programs never can reach all youth and adults with special needs, we have improved our services to the disadvantaged, the handicapped, and to women.

In like fashion, the remedial approach developed by the U.S. Department of Labor also has grown significantly. While we each have our detractors—some of whom never have seen the inside of a vocational school, a Job Corps center, or a skills center—nor ever have tried to teach or otherwise help a severely disadvantaged youth or adult—we have had our successes.

However, the problem that I see coming is that changing conditions and new national needs—indeed, international conditions and needs—may be making our definition of problems and our approaches—to which we are so deeply committed—seem dated, if not jaded. To many, we *seem* to be talking in somewhat shopworn clichés; and I sometimes wonder whether they have not actually *become* clichés, in our own thinking.

We recently encountered this "phenomenon" in the drafting of our proposal for the reauthorization of the Vocational Education Act. We developed a design that would give the states much more freedom of choice and relief from administrative burden; and which, additionally, contained an entirely new part focused on economic development and national needs, such as helping to answer skill shortages in the nation's defense industrial base. We were prepared for some kinds of resistance to these ideas, but not for others. We were not prepared for some of our own experienced staff saying that it "looked too much like the old Vocational Education Act." Neither were we prepared for the similar reaction from some congressional staffers who labeled our "innovations" as "more of the same old stuff."

Now, I have to ask myself—just as you have to ask yourselves—are the approaches of the past twenty years embedded so deeply in our thinking that, even when we try our hardest to do something "new," the old ideas and concerns are only camouflaged? And, if that is the case, can we still defend those basic concepts?

As early as 1965, as state director of vocational education in New Jersey—and with the full support and blessings of the governor and the state legislature—I personally declared a "War on Unemployment" that trained 60,000 sixteen- to twenty-four-year-old, out-of-school, out-of-work youth and young adults in a network of thirteen skill centers.

Using this, I pondered what I might say about the "educational context" of this difficult problem. I first thought that I might review some of the causes of the problem; then, speak to those areas where public education could provide specific treatment. However, as I thought about this approach further, I realized that there was little that would be new to any of you. You have heard it all, time and time again, and have read the same analyses in a hundred different reports and articles.

What I *did* find out, however, in the course of deciding on an approach to this topic, was that many policymakers no longer believe that the problem can be solved through "Band-Aid" remedial programs, but that a long-term program for improvement of our educational system is the answer.

It is obvious that if a person needs skill training, *wants* that training, and has some minimum ability to undertake that training, there are programs in both vocational education and remedial human resource training that can successfully help that person. If that same kind of person has limited proficiency in the English language, we now have programs that can help the person overcome that problem.

But what of the "hard-core" disadvantaged youth, born into poverty and crime, in trouble since elementary school, distrustful of "society," and following a code of "survival conduct" that neither you nor I can ever understand? These are the youths who have been the targets of employment and training programs, much more so than of vocational education—and I really admire those who have defined this difficult task for themselves, because successes with this group are, frankly, few and far between.

How many of this type youth do we have in the United States? No one really seems to know, but one figure that has been used (and challenged, of course) is 400,000, or *less than one-fifth of 1 percent of our population!*

Given the public mood today, and given the budget squeeze that all education and training programs must face—how would you expect most citizens to react to a program largely devoted to such a small percentage of the population, when much larger segments of that population also are demanding similar services? Let me tell you one experience I recently had. Our reauthorization proposal was sent to a wide cross-section of vocational education directors and other officials for review. One of the features of that proposal is a set-aside of 20 percent for disadvantaged, unemployed youth in depressed urban and rural areas, figured against only one subpart of the Act. If a state chose to expend the legal minimum on these persons, it would have to devote but *8 percent* of its federal funds under the Act for these purposes.

Among many other replies less vigorously worded, I received one that figuratively "scalded" us, as follows: "To give preference to out-of-school youths and adults who are out of work rewards failure. ... Is a potential 'dropout' to receive more attention and a higher priority than a hard-working student with a potential for high productivity and technical expertise? What is the new law to focus on primarily—vocational training or social welfare?" You might chalk this comment up to disguised racism, except that the commentator happens to belong to a minority group; and I am quite sure that he included members of his minority as among those able students who might unfairly receive—in his view—a low priority in the use of federal funds.

There are those whose argument is that the problem will "solve itself." Among those who hold the latter view are some demographers and administration economists. In the September 24, 1981 issue of the *Manpower and Vocational Education Weekly*, William Niskanen, a member of the President's Council of Economic Advisors, is quoted as saying that demographic changes will go further than economic policies to improve job prospects for young people in the coming decade; and, that an expected decline in the numbers of eighteen- to twenty-one-year-olds will cause "a substantial tightening of the labor market in the 1980s, regardless of economic policies ..." (p. 3). He also goes on to say that the results of this administration's economic policies will increase the number of available jobs, thus further alleviating the youth unemployment problem.

Notably, this correction of a long-standing problem is to be accomplished by normal functioning of the private sector, not by publicly funded job-training programs. As a matter of fact, Mr. Niskanen states that the shortage of skilled craftsmen in the United States is—and I quote—"largely a consequence of interference with price-setting or wage-setting mechanisms" (p. 4), not—it would seem—because of any lack or poor quality of job-training programs. I will return to this apparent theme of the administration a bit later.

I am not citing these various arguments as a prelude to any declaration that there *is* no youth employability problem. Personally, I believe that there is a real problem, however, of a more specific nature than is usually stated, and it is one that I do not believe can be solved by educational means alone. I refer to the special disadvantagement for youth in both severely depressed rural areas and the inner cities. In the near future, my office will be announcing the awarding of a contract to the National Academy of Sciences—the purpose of which will be to assemble an expert panel to study the whole question of enterprise zones, youth unemployment in the inner city and in depressed rural areas, and how vocational education can respond to these problems in new and creative ways.

However, note the context—overt and otherwise. First, it is an acknowledged fact that several major, older cities in the Frost Belt are in danger of bankruptcy; further, that such bankruptcies would be a financial catastrophe for the nation. These considerations led to the Kemp-Garcia Enterprise Zone Bill, which—significantly enough—has no job training component as such. This much is the overt or stated context. However, there is another time bomb ticking in these cities: the human dynamite that exploded so alarmingly in Watts, Newark, Rochester, and—yes—in Washington, D.C. in the 1960s. No one wants to go through that experience again. Therefore, the emphasis we intend to place on urban skilled work force development has two specific purposes: *to aid directly in economic revitalization of the inner cities and to prevent their social disruption.* These are specific goals and, I believe, are of broad national concern.

My point is that there probably would be no Kemp-Garcia Bill if there were not threatened bankruptcy of major urban areas; and there probably would be no National Academy of Sciences contract if continued lack of training resources in the inner city did not pose the possibility of dangerous social upheaval. In neither case would these initiatives have been made on the basis of any social or educational "debt" we owe to the disadvantaged in those cities—whether or not that is actually the case, and whether or not we wished to meet any such debt. There would be higher priority uses for our limited funds, according to what we perceive to be the national consensus and agenda. I use the word "perceive" because we have little research to go on, other than perhaps the annual Gallup Poll of public attitudes toward education. However, my guess is that the public-at-large is more than a little tired of defining the issue in terms of what society, or the employer, or the military, can do *for youth* and is more inclined to ask what youth—disadvantaged or not—can do *for society*.

I suggest that the entire question of youth employability must be considered in the broad context of national developments anticipated during the 1980s and of national goals derived from these developments. Choices will have to be made regarding how we henceforward define this problem, how we rate it compared to other priorities, and, consequently, how many resources we intend to devote to attacking it.

In my view, there are three externally based "dimensions of change" that must be assessed in order to provide a context for prioritizing and considering any skilled work force development program or issue such as youth employability. These dimensions are: economic, technological, and demographic. In addition, because of the different philosophy of this administration, we must consider internally initiated changes in governance, if only because these changes largely will determine what the federal role will be in skilled work force development.

Since I am speaking to experts in economics and its implications for the work force, I need only refer briefly to what is now very familiar. Under the heading of *economics* we have the problems of overall low productivity, deteriorating competitive position in some industries, aging and inefficient plants, similarly aging infrastructure that supports the industrial base, uneven energy costs among the regions, inflation, and a necessarily short supply of money at all levels—particularly for "social programs," a catch-all term that unfortunately seems to include job training.

Under the heading of *technological change* we have the rapid technological change in many industries (plus the introduction of some completely new technologies), further increases in this rate of change because of expected new investment in industrial research and development, the massive changes predicted because of advances in information technology, increased use of automated equipment (partly due to the skyrocketing costs of labor), the resulting obsolescence of skills in many fields, and the corresponding need for training and retraining programs for ever-increasing levels of skills.

Under the heading of *demographics* we have the overall aging of the American work force, a projected decrease in the percentage of the work force composed of youth (but an increase within that age bracket of minorities), an outmigration of skilled workers from the Frost Belt to the Sun Belt, a gradual skewing of the work force toward the service sector and white-collar occupations and away from the manufacturing sector and blue-collar occupations—a disequilibrium that some economists liken to an inverted pyramid, a tendency for adults to remain in the work force longer and to opt for later retirement, a continued influx of women (particularly, older married women) into the work force, an increase in the number of skilled adults whose jobs are being lost through structural adjustments in the national and international markets, an increasingly mobile work force—less in terms of locational mobility than in terms of occupational mobility, and a continuing concentration of poor, unskilled or low-skilled workers in densely populated urban centers.

The fourth dimension of change involves *governance* and has more to do with (1) administrative responsibility and (2) delivery system organization than with program emphasis or direction. Nevertheless, it poses policy questions that should be addressed by this forum.

Regarding *administrative responsibility*, this administration is in the process of transferring not only operational authority to the states and localities, but also final responsibility for the direction and accomplishments of the programs. The federal government becomes a strictly junior partner and facilitator; certainly, not a major source of funds for whatever programs the other governmental levels may decide to offer. As far as funding is concerned, this is more in line with the federal government's strategy in vocational education than in job-training programs under CETA.

Regarding *delivery systems* themselves, this administration shows a pronounced preference for dealing with the private sector and for relying on it to provide improvements in many different areas. Although what this means for all of skilled work force development—including vocational education—is not clear, it is interesting to note that one of the few parts of CETA that appears, more or less, to be holding its funding level is the Job Corps. This program is typically *not* run by or through public governmental entities, but by the private sector under direct contract with the federal government. Assistant Secretary Angrisani, administrator of the Department of Labor's Employment and Training Administration, has been quoted as intending to transfer as much training responsibility to the private sector as possible and to persuade this sector that the funding for such training should be a normal cost of operation.

This suggests that—in the case of youth employability efforts—tactics must change, in that employers will need to be persuaded that embarking on such a program will be efficient, from a profit point of view, and should be at least as high a priority as—for example—retraining existing personnel.

All of these far-ranging developments must be assessed before we go much further with any particular thrust such as youth employability. Although such a thrust may be intrinsically attractive and worthwhile, it no longer can be assumed that significant amounts of limited time and funds should automatically be devoted to it. This is particularly true at a time when the basic issue of whether or not there should *be* a strong federal role and policy in skilled work force development is being called into question.

There is the danger—if not yet the probability—that this Forum might well assemble or develop excellent approaches to the problem of youth employability, only to discover that the "parade" we thought we were leading had turned a corner, some miles back. To avoid this outcome, I hope that while you address the youth employability problem during this Forum, you will do so within the context provided by basic questions such as the following.

1. *If the problems of skilled work force development are simply transferred to the employer —*
    - What assurance is there that individual firms will approach these problems so as to benefit the entire nation, rather than in a way that will only maximize profits for a single firm?
    - Is there evidence that most *large* firms have been able to mount massive training programs for their own prospective employees, and under what specific circumstances has this occurred?
    - Can second- and third-tier subcontractors—where most of the new jobs are created and where most of the future skill shortages are expected to occur—handle their own training, in the same manner as larger firms?

- Whereas market mechanisms may, by driving up wages, ultimately attract more workers into shortage occupations, how quickly will this happen (given training lead times in skilled occupations) and what will these high labor costs do to the nation's anti-inflation fight during the interim?

2. *If the problems of skilled work force development are simply transferred to the individual, as actual and opportunity costs —*
   - How will poorer segments of the population, including youth and young adults as well as minorities—which presumably have as many potential skilled workers as more affluent segments—be able to afford these costs?
   - If "access imbalances" are not prevented by either private-sector or governmental action, could the entire national training effort be crippled by a rash of litigation?

3. *Given the current and longer-term shortage of funds, can the states take over the support of many programs without shortchanging at least some of them?* And, do they uniformly have the management and other staff capabilities to assume total responsibility—in the event that this responsibility is transferred to them, as may be the case in vocational education?

4. Given the clear need for new capital investments, together with the decreasing funds available for training at all governmental levels, *how can the dual tasks of training new workers and upgrading the skills of the existing work force be funded*—especially under conditions of rapid technological change?

5. *Given this same shortage of funds, how are objective choices to be made between competing national needs such as —*
   - Treating the special problems of disadvantaged youth *versus* retraining adult workers who are structurally unemployed; or, either one versus training women to enter or reenter the work force in nontraditional occupations?
   - Or, providing more modern training facilities in older cities in the Frost Belt versus training workers now moving into the Sun Belt to fill available jobs?

   And, what are the risks involved in letting these decisions "take care of themselves"?

6. *How can we efficiently and economically attack any skilled work force development problem (including youth employability)—from any level or by any means—if we have no common, comprehensive system for assessing current skill needs, let alone for predicting future shortages?*

Since I have raised these basic questions and have asked you to consider them, it is only fair that I share with you our own responses to the youth employability problem—in the context of other skilled work force development needs—as they are contained in our reauthorization proposal to the Secretary of Education; and, as we have discussed them with vocational educators in the field.

Whereas we certainly do not have answers to all of the questions we face, our overall approach is to focus on economic revitalization and other national skilled work force needs, rather than to emphasize service to any particular client group for its own sake, so to speak. Within this context (and in response to trends I have already described), our emphasis is shifting to these areas: *program quality and technical scope; closer collaboration with business, industry, and labor;* and *retraining adults.*

From this description, you might well conclude that we are deemphasizing the youth employability problem. This is true only in a general sense and in relationship to other national needs, which have increased in importance. However, we continue to be concerned specifically with the needs of disadvantaged youth in depressed rural and urban areas; and as I have already described, our proposal carries a special set-aside of funds for these purposes.

Another consequence of our response to national developments—in this case, rapid technological change—is a planned strong move into high-technology training. This, in turn, implies more emphasis on postsecondary technical education. To some extent, this further implies an emphasis on identifying and training the better prepared, more able, and more highly motivated of our youth and young adults.

However, we do not intend to neglect secondary vocational education, which serves a much broader spectrum of the youth population. As a matter of fact, secondary-level enrollments comprised 58 percent of the total enrollments in vocational education during the 1979-80 school year.

If secondary-level programs are allowed to dwindle, we cannot be assured that a sufficient number of graduates will both be ready for more advanced instruction and will, in fact, choose to undertake the more difficult technical careers in which future needs are expected to be great. For this reason, we have resisted the attempts of those who would limit the use of federal funds to the postsecondary level; and to ensure this particular emphasis on *overall* youth employability, we have included in our proposed legislation a special set-aside for serving secondary-level youth.

Although we cannot directly effect changes in general education by means of vocational education—for example, through our legislation—there are two important approaches I intend to promote among my nonvocational education colleagues, both of which I am sure would have long-term benefits for youth employability. They are as follows:

- Increased emphasis on prevocational guidance and career exploration, without which students will not have enough contact with nonbaccalaureate occupations to make realistic career choices. This lack may well explain a good deal of the well-publicized "mismatch" between people and jobs.
- Increased emphasis, beginning in the elementary grades, on technology and the manmade environment, and especially on the sciences and mathematics that undergird them. In these respects, we have fallen alarmingly behind the educational systems of our competitors. Without these strengthened elements, we will truly "disadvantage" both our youth and ourselves for the future.

I hope I have persuaded you that my concerns about concentrating too heavily on the youth employability question relate to a possible loss of perspective, rather than a lack of appreciation of—or attention to—this problem. Youth employability is important, but the more basic issue may well be the survival of the very programs and governmental mechanisms that are trying to address this problem.

This challenge demands our immediate attention, and I promise you our every effort, in vocational education, to work with you to meet this challenge. We have no alternative but to join forces and find common ways to adjust more effectively to the changes that confront us.

Job Training in the Military

RICHARD V.L. COOPER and MICHAEL P. HUERTA

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Military Training and Youth Employment: A Descriptive Survey

INTRODUCTION

In fiscal 1982, the military will spend more than $10 billion on training. About 350,000 young men and women will enter the military for the first time and receive a wide variety of initial training. In addition, the military will provide literally hundreds of courses, not only to those entering the military for the first time, but also to those already enlisted. Courses range from flight training, to nuclear propulsion systems, to cooking. They range in length from just a few days to over a year. Altogether, the military will devote some 236,000 student manyears to training. Another 190,000 manyears will be devoted to the support of training—i.e., instructors, clerical, maintenance, and the like. Thus, by any measure, the military maintains a large training establishment.

The reason for this large training system is, of course, to provide military personnel with the skills needed to perform their duties. With relatively few exceptions, as in the training for physicians, the skills

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provided by civilian training institutions do not satisfy all the needs of the military. The military is thus forced to provide much of its own training. Although the military could theoretically contract out its training requirements to civilian institutions, this is done only in relatively few instances, such as in advanced professional education for officers.

Recognizing that the principal reason for military training is to provide military personnel with military and other job-related skills, it also is important to realize that military training can and does serve a potentially important role in relation to American society in general. Although some aspects of military training clearly are unique to the military, many are not, and in fact may provide skills that are useful for a broad range of civilian occupations. The more obvious examples of occupations where military-acquired skills are directly applicable include pilots, aircraft mechanics, and nuclear engineering and operations, to name just a few. But the potential applicability of skills acquired through military training and experience is much broader.

Military training is important from this larger societal perspective in that many of the instructional approaches and technologies developed for the military can be and have been adopted for use by civilian training institutions. The military played an important role, for example, in the development of "criterion reference testing" as a tool used in vocational training.

Despite the potential importance of the interface between military training and the civilian sector, the evidence regarding this is surprisingly anecdotal. It is thus noteworthy that the National Center for Research in Vocational Education has recognized the importance of this issue by including this paper in this First Annual Forum on Employability Development.

The purpose of this paper is relatively modest: to acquaint the reader with the nature and content of military training and its potential impact on the civilian labor force. Although there are certainly hundreds, if not thousands, of studies pertaining to military training, the literature is notably sparse in terms of the broader perspective regarding what military training is and how it fits into the larger context of American society. As a result, this paper lays the foundations for more detailed future inquiry. In this sense, this paper is more a descriptive survey than a detailed analysis.

The paper begins with a brief overview of the military, what it is, how it is organized, and who serves. The section titled "The Military Training System" describes military training, the kinds of courses included, the instructional approaches used, and so forth. The section titled "The Impact of Military Training" summarizes the available literature with regard to what is known about the impact of military and job experience on the civilian work force. Conclusions and recommendations for further research are presented in the last section of this paper.

OVERVIEW

Before turning to the specifics of the military training system, it is useful to first outline the nature and structure of the military personnel system. The reason for doing this is twofold. First, because this paper is presented to an audience that includes many who may be largely unfamiliar with the military, a general overview of the military institution helps to provide a frame of reference. Second, the military training system is an integral part of the larger military establishment, so that it is important to understand the nature of the military personnel system in order to understand the whys and wherefores of the military training system.

This section accordingly reviews in a broad sense the nature of the military personnel system and, as such, is intended to serve as a lead-in to the discussion of military training in the section on "The Military Training System." The following paragraphs focus on three topics: (1) a general description of the military personnel system, (2) the enlistment process, and (3) the demographic characteristics of new recruits.

General Description of the Military

Organizationally, the U.S. Department of Defense (DoD) is divided into the Office of the Secretary of Defense (OSD), the four military services,* and a variety of specific defense agencies such as the Defense Nuclear Agency and the Defense Intelligence Agency. OSD and the other defense agencies are generally concerned with broad DoD-level management and coordination for specific, but generally nonmilitary, functions (in the narrow sense). The military services, on the other hand, are responsible for specific mission requirements, as well as for their own internal management, including training.

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*The four services are the United States Army, Navy, Marine Corps (USMC), and Air Force (USAF). Although formally a part of the Department of the Navy, the Marines are traditionally viewed as a fourth military service.

Each military service can in turn be structured into its major programs and activities—such as strategic forces, general purpose forces, and support functions, including training and medical. The distinction among the services is important to understand since, as described in the section on "The Military Training System," the services have adopted somewhat different approaches to training. Although the services' training systems are similar in the aggregate, for a variety of reasons they differ somewhat in training philosophy, structure, and content.

In addition to the distinction by service, it is useful to note two other organizational distinctions: the active/reserve mix and the officer/enlisted mix. In this regard, the defense manpower system contains three broad categories of personnel. These include uniformed personnel in the active forces, uniformed personnel in the reserve forces, and civilian employees of the U.S. Department of Defense. Reservists typically serve an initial period of time on active duty, say for about six months, during which time they receive their initial training, and thereafter train periodically with the reserve unit to which they are assigned.

Military personnel can be classified further according to whether they are officers or enlisted members. For the most part, the officer corps has the primary management and leadership responsibility in the force; enlisted personnel tend to correspond more closely to technician and blue-collar workers in the civilian labor force. The officer corps is divided into two groups: commissioned officers and warrant officers. Warrant officers are primarily senior supervisors of the enlisted force, although some of the services have used warrant officers in other roles—most notably, the Army's use of warrant officers as helicopter pilots. Commissioned officers generally occupy leadership, managerial, and professional positions.

Table 5-1 shows the size of today's military establishment according to the various attributes just described—i.e., by service, active/reserve/civilian mix, and officer/enlisted mix. Altogether, the U.S. Department of Defense employs in the neighborhood of 4 million individuals, not counting reservists who have no peacetime obligation or civilian employees of defense contractors.

TABLE 5-1

Numbers of Personnel in the Military: Fiscal 1980
(000s)

	Army	Navy	USMC	USAF	Other Defense Agencies	Total DoD
Active Duty Military:						
Commissioned Officer	85	60	27	98	—	261
Warrant Officer	13	3	1	0	—	17
Enlisted	674	460	170	456	—	1,780
Academy Cadets	4	5	(a)	4	—	13
Subtotal	777	527	188	558	—	2,051
National Guard and Reserves[b]	569	87	35	155	—	846
ROTC	65	8	(a)	20	—	93
Civilian Personnel[c]	397	313	(a)	247	78	1,035

SOURCE: U.S. Department of Defense 1981c.

[a] Included in Navy total

[b] Reserves and Guard in paid status

[c] Includes direct hire and indirect hire personnel

Two aspects of the military personnel systems in general, and the enlisted personnel system in particular, deserve further mention. First, the military is structured according to what can be termed a "closed" personnel system. With few exceptions, entry into the military occurs only at the bottom; there is little lateral entry. For the purposes of management and compensation, the military is structured into ranks, or pay grades. For enlisted personnel, there are nine pay grades, E-1 through E-9; for commissioned officers, there are ten, O-1 through O-10. The closed nature of the military personnel system thus means that enlisted personnel enter as E-1s, and progress sequentially through the ranks; commissioned officers enter as O-1s.* Because the eligibility for promotion is in large part a function of length of time served in the present grade, the military grade structure—and, hence, the management structure—is determined largely by seniority.

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* Warrant officers, however, are typically drawn from the senior enlisted ranks.

The second aspect of this system that deserves particular note is that individuals joining the military contractually obligate themselves for a specified period of service, generally between two and six years. Thus, whereas civilian workers are generally free to leave their employers at any time, military personnel are obligated to fulfill the terms of their contract.

The closed nature of the military personnel system means that the military recruits largely unskilled or semiskilled youth who acquire their skills while in the military through training and on-the-job experience. Indeed, because of this, 95 percent of enlisted personnel enter between the ages of seventeen and twenty-one. Whereas the closed nature of the military personnel system is responsible for this type of new recruits entering the military, it is the period of commitment that enables the military to provide the substantial amount of training that is given to new recruits.

The closed nature of the military personnel system has another important consequence, and that concerns the presence of the military in the youth labor market. In this regard, the aggregate force sizes presented earlier in table 5-1 understate substantially the magnitude of this presence. Whereas those figures show that military personnel constitute about 2 percent of all United States' employment, the closed nature of the military personnel system means that in the neighborhood of 400,000 new recruits must be attracted into the services each year. Put differently, about one out of every five eighteen-year-old males will serve in the military, and about one out of every three noncollege-bound eighteen-year-old males will serve. Clearly, then, the military has an enormous presence in the youth labor market.

Finally, this brief review would not be complete without some discussion of the military job mix. Although it may be common to think of the military in terms of the combat soldier, table 5-2 shows that only about 10 percent of all enlisted personnel are in what can be described as "combat arms" specialties such as infantry, armor, tank crews, and so forth. (To be sure, a much larger fraction would be engaged in combat-type activities in the event of hostilities.) Nearly 90 percent of enlisted personnel are in other occupations, many of which have civilian counterparts. These include electronics repair, vehicle maintenance, aircraft maintenance, medical technology, and clerical occupations, to name just a few.

TABLE 5-2

Distribution of Enlisted Personnel by Occupational Area

Occupation	*Percentage*
Combat Arms	12
Electronics	10
Communication/Intelligence	7
Other Specialists	2
Electrical/Mechanical	22
Medical/Dental	5
Administrative/Clerical	18
Service and Supply	11
Craftsperson	5
Other	9
Total	100

SOURCE: Cooper 1977

The Enlistment Process

Next, we consider the enlistment process. This is useful both for understanding the military training system and for understanding the relationship between the military and "disadvantaged" youth.

There are two parts to the enlistment process: (1) individuals must decide whether they want to join the military, and (2) the military must decide whether the individual is suited to military service. The discussion below focuses on the latter—i.e., the screening process. Figure 5-1 provides a simple schematic of this process.

In the initial examination, the military—like most employers--uses a series of screening criteria to sort out who would not be expected to perform satisfactorily in the service. This means determining whether individuals are *trainable*, whether they can perform the requisite *job duties*, and whether the individuals are likely to pose significant *disciplinary* problems.

The screening process accordingly consists of medical, moral, and mental examinations and evaluations. For example, individuals must pass a physical examination. They must likewise be morally fit; a felony conviction, for instance, is grounds for rejection. The medical and moral criteria differ from the mental criteria described in the following paragraphs in that they are generally applied on a binary basis—that is, the individual is deemed either fit or not fit for service (although waivers can be granted).

To test for mental aptitude, the individual is given a battery of written tests, known as the ASVAB (Armed Services Vocational Aptitude Battery). The ASVAB is used to test both for the individual's general mental aptitude and for specific occupational area aptitudes (e.g., mechanical vs. electrical).

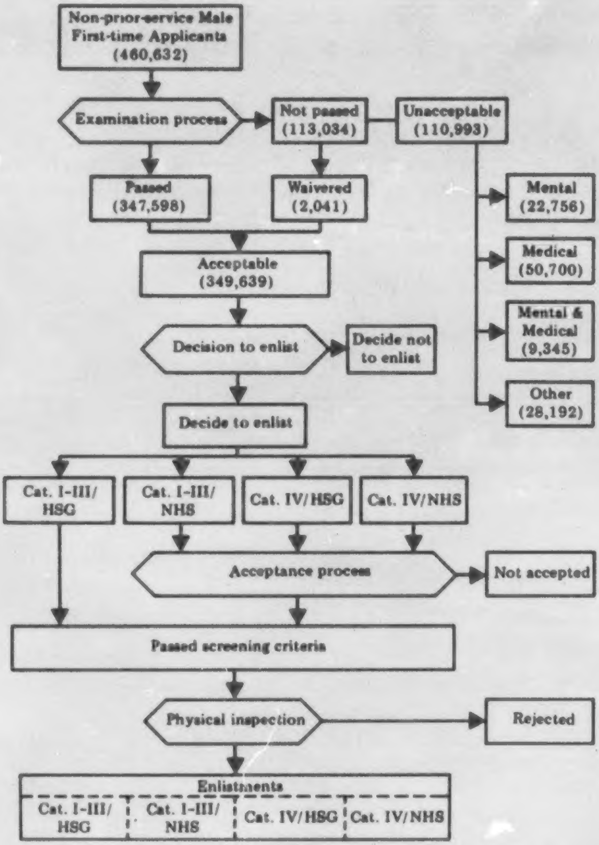
With respect to the general aptitude, the results of the test are translated into a percentile score, relative to some reference population (the 1945 mobilization population serving in the military). Those falling in the top 7 percent are classified as category I; those in the bottom 10 percent, as category V. The complete list of "mental categories" follows.

Category	*Percentile*
I	93-100
II	65-92
IIIA	50-64
IIIB	31-49
IVA	21-30
IVB	16-20
IVC	10-15
V	0-9

Category V individuals are legally ineligible to serve. The services typically accept all category I-III high school graduate volunteers. (High school graduation is used as an indicator of the ability to succeed in a structured environment and, in fact, is the single strongest predictor of successful completion of the initial tour of duty.)

Although category IV individuals are legally eligible to serve, the services generally try to minimize the numbers of these individuals allowed to join. For example, individuals scoring below the thirty-first percentile may have to score average or better than average on one or more components of the exam.

In addition to serving as the basis for initial acceptance or rejection, the ASVAB scores are used in assigning individuals to particular jobs in the military, and thus to particular training programs. This assignment process is a function of individuals' particular aptitude scores, their preferences, the services' needs at that time, and the availability of training slots.



LEGEND: Category I-IV (see text); HSG = high school graduate; NHS = non-high school graduate

Figure 5-1. The enlistment process: calendar year 1972

SOURCE: Cooper 1977

Demographics of New Recruits

Who serves in the military? The answer to this question is important for two reasons. First, military training must be geared according to the types of people that enter the military. Second, to understand the interface between military training and society more generally, it is necessary to understand the kinds of young people that receive military training.

Numbers. As shown in table 5-3, the military recruits between 250,000 and 350,000 young men into the military each year. Recognizing that about 2 million young men reach age eighteen each year and that 800,000 or so of these enter college, this means that between one out of every three or every four young men not going to college will enter the military.

TABLE 5-3

Nonprior Service Enlistments
(000s)

	Fiscal Year						
	74	75	76	77	78	79	80
Male	354	381	366	356	274	274	310
Female	29	35	31	31	38	42	49
Total	383	416	391	387	312	316	359

SOURCE: Data provided by the Office of the Assistant Secretary of Defense (MRA&L).

Also significant, table 5-3 shows that the military recruits sizable numbers of young women each year, between 30,000 and 50,000. Recruiting significant numbers of young women is a relatively recent phenomenon for the military, since prior to 1972, women were restricted by law to being no more than 2 percent of the force. As a result of the 1972 policy change, the participation of women in the military has increased significantly. Women now comprise more than 8 percent of total force strength.

Mental aptitude and educational attainment. As described earlier, new recruits are classified according to mental aptitude and level of education attainment. Table 5-4 shows that about two-thirds of enlisted recruits are high school graduates at the time of entry. (Of these, between 5 and 10 percent have had at least some college.) Similarly, about two-thirds of new recruits fall into mental categories I-III—that is, in the upper 70 percent of the mental aptitude spectrum.*

TABLE 5-4

Distribution of Enlisted Accessions According to Mental Aptitude and Educational Attainment (Percentage)

	1953-59	1960-64	1965-69	1970-72	1973-80
Non-high school Graduates	N.A.	35%	25%	33%	33%
Mental Category IV[a]	24%	17%	30%	35%	32%
(N.A. = Not available)					

SOURCE: Cooper 1981a

[a] Corrected for "renorming" of test results. For a discussion of the method used to correct for the norming problem, see Cooper, Richard V. L. "The All-Volunteer Force: Status and Prospects for the Active Forces." A paper prepared for the Atlantic Council, Washington, DC, October 1981.

Race. As shown in figure 5-2, the racial composition of enlisted recruits has changed substantially over the past fifteen years. Blacks comprise between 20 and 25 percent of new recruits, up from about 10 percent in the mid-1960s. (A little over 30 percent of Army recruits are black.) Hispanics represent about 5 percent or so of all recruits.

Age. Better than 95 percent of all new recruits are between the ages of seventeen and twenty-one. The modal age of recruits at the time of

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* In 1980, it was discovered that the test scores had been "misnormed" for several years, the result being that many recruits previously thought to be category III instead should have been classified as category IV. The results presented in table 5-4 reflect the "renormed" test scores.

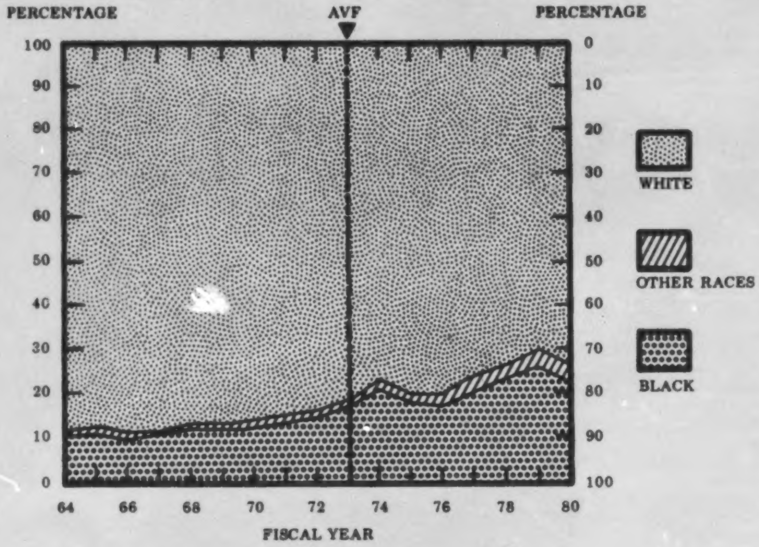

Figure 5-2. Distribution of enlisted accessions by race

SOURCE: Hunter and Nelson, forthcoming.

entry is eighteen, with large numbers of seventeen-year-olds and nineteen-year-olds also joining.

Other socioeconomic indicators. As shown in table 5-5, the military draws its recruits from all socioeconomic strata. As would be expected, though, individuals from high income areas are less likely to serve than those from low income areas. However, we find that the military draws a roughly representative sample of young men not enrolled in school.

TABLE 5-5

Distribution of Male Enlisted Accessions According to The Average Family Income of Their Home Address ZIP Code[a] (Percentage)

Percentile[b]	Income Range[c] ($000s)	Enlisted Accessions[d]	16-21-Year-Old Males[e]	
			All	Not in School
> 99	≥ $24.5	0.3	1.1	0.4
95-99	$17.0-$24.5	2.7	5.1	2.6
90-95	$14.7-$17.0	4.9	7.4	4.6
75-90	$12.2-$14.7	19.0	20.8	16.7
50-75	$10.3-$12.2	29.7	28.6	28.0
25-50	$ 8.4-$10.3	25.2	22.6	27.7
10-25	$ 6.3-$ 8.4	14.0	12.1	16.7
5-10	$ 1.3-$ 6.3	3.0	2.1	2.9
< 5	< $ 1.3	1.2	0.2	0.4
	Total	100.0	100.0	100.0

SOURCE: Cooper 1977.

[a] Reports the percentage distributions for total DoD enlisted accessions by percentile rankings of five-digit ZIP codes located in Standard Metropolitan Statistical Areas. SMSA five-digit ZIP codes were ranked according to average family income within the ZIP code, and then grouped into percentile groupings. Accessions were then matched with these percentile groupings by using the home address ZIP code for each enlistee or inductee.

[b] Percentile rankings, based on within ZIP code average family income, for five-digit SMSA ZIP codes. Based on 10,708 five-digit ZIP codes out of all 11,972 ZIP codes located in SMSAs (data on either population or income were not available for the remaining 1,264 ZIP codes).

[c] The range of within ZIP code average family incomes for each percentile grouping. Based on 1969 incomes reported in the 1970 census.

[d] Percentage distributions for enlisted accessions (see note [a] above). Time period 1/73 through 6/75.

[e] Percentage distributions for all sixteen- to twenty-one-year-old males residing in these ZIP codes (All) and those not enrolled in school.

THE MILITARY TRAINING SYSTEM

The military training system is the mechanism through which individuals in all the services are provided with the skills and knowledge required to carry out assignments associated with military service. This includes military conditioning and technical and skill training. The section presents a discussion of the structure and characteristics of the military training system. It focuses first on the purpose of military training, its overall objective and more specific goals. This is followed by a description of the features of the training system. This includes discussions of the types of training conducted in each of the services, instructional techniques in use, training philosophies, and the organization of the training establishment.

The Purpose of Military Training

Military training is designed to meet one overall objective: to provide the services with the human resources qualified to carry out the duties of military service. The military is thus the end user of the results of its training system, and training is concerned primarily with the military's responsibility for ensuring national security.

That the military trains for its own use is a fact that sets it apart from other training mechanisms such as the nation's system of schools and colleges, or federal training programs such as CETA. The overall objective of these other systems is to prepare individuals to serve as productive members of society. This goal is less tangible than the military's, since society's needs are more difficult to define, are subject to change, and encompass a much broader scope of functional areas. The military thus has a more clearly defined overall objective, which lends more focus to its training efforts.

The overall objective of preparing military personnel can be translated into these two specific training objectives:

- Military indoctrination training
- Training in specific, defined skill areas

Military indoctrination is the process of transforming an individual from a civilian into a member of the armed forces. This includes physical conditioning and introduction to military functions, practices, and courtesies. A large part of an individual's initial recruit training is devoted to the military indoctrination aspect.

Skills training involves military skills and job-related skills. Military skills include offensive and defensive fighting techniques, the use of firearms, military drill, and the like. These generally are required of most members of the military services. Job skills are those required to perform any of the specific jobs in the military. The focus here is much narrower than professional training in the civilian sector. The military is for the most part interested in an individual being able to perform a specific task. It is less concerned with providing an individual with the universe of knowledge of a particular discipline.

In sum, the military training system is focused on the military's objective of ensuring national security. It tends to be performance oriented, concentrating primarily on job skills, but with some training in general functional knowledge. The military is the end user of the results of its training system; consequently, military objectives generally take precedence over societal objectives.

Structure and Scope of the Military Training System

The military training system is a massive organization. It is expected to have costs in excess of $10 billion for FY 1982 and to provide over 236,000 student manyears of training. It is involved with virtually every aspect of the training and education individuals can expect to receive in the course of their military career.

Table 5-6 summarizes the FY 1982 projected training loads, support manpower, and funding levels for active duty and reserve military personnel. The training load figures approximate student manyears of training to be conducted in each of the major training categories.* The training

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*As mentioned previously, the training load for a given period approximates student manyears of training to be provided. Generally, the load is calculated as follows:

$$\text{Training Load} = \frac{\text{Entrants} + \text{Graduates}}{2} \times \text{Course Length}$$

(expressed as a fraction of a year)

SOURCE: U.S. Department of Defense, 1981a.

This formula assumes a relatively constant rate of attrition (the difference between entrants and graduates). When attrition occurs at other than a uniform rate throughout a course, more complex formulas and computer simulations are used to determine training loads.

For the remainder of this paper the term student manyears will be substituted for the term training load.

TABLE 5-6

Active and Reserve Training
FY 1982

	Training Loads (i.e., student manyears) (000s)	*Training Support Manpower* (000s)	*Total Training Manpower* (000s)	*Funding* ($ millions)
Accession Related Training				
Recruit	51.6	10.1	61.7	$ 822.4
Army One-Station Unit Training	27.2	8.5	35.7	322.4
Officer Acquisition	17.5	6.4	23.9	313.0
Initial Skill (Officer & Enlisted)	78.4	34.1	112.5	1,500.2
Undergraduate Flight	6.1	16.8	22.9	1,327.1
Medical	(a)	3.0	3.0	275.6
Subtotal	180.8	78.9	259.7	4,560.7
Other Training				
Other Specialized Skills	46.1	20.1	66.2	882.2
Other Flight	0.6	1.7	2.3	130.5
Professional Development	9.0	3.9	12.9	329.5
Subtotal	55.7	25.7	81.4	1,342.2
Training Overhead	—	86.5	86.5	4,617.7
Total	236.5	191.1	427.6	$10,520.6

SOURCE: U.S. Department of Defense, 1981a.

[a] Medical personnel in training included in other categories (e.g., specialized skill, officer acquisition, etc.) as appropriate.

support manpower totals represent the numbers of people, both military and civilian, that conduct and support training. The funding levels are projections for FY 1982 as of March 1981.

As can be seen in table 5-6, Specialized Skill Training (initial skill training and other specialized skill training) represents the largest component of military training, both in terms of student manyears and resource expenditures. Recruit Training (basic training) also constitutes a major part of the total training picture, as does Army One-Station Unit Training, a program designed to meet the objectives of both Recruit Training and Initial Skill Training.

The table also demonstrates the diversity of the resource requirements for military training. Undergraduate Flight Training, for example, requires training support manpower of 16,800 and has projected costs of $1.3 billion to provide a relatively low level of 6,100 student manyears of training. This is proportionately a much greater investment than Recruit Training, which is provided on a much larger scale, 51,600 student manyears, yet has training support manpower of 10,100 and projected costs of only $0.8 billion.

The services differ in their missions, and consequently they have different training requirements. Each of the services maintains its own independent training command, and there are differences in the type of training conducted from one service to the next. Table 5-7 presents training student loads by service and major training category.

Military training programs can be divided into two basic groups:

- Formal schooling
- On-the-job training (OJT)

Formal schooling describes training that takes place at any of the DoD formal training installations. This form of training generally is conducted away from the job site and involves formal course work, such as classroom training and a standardized program of study.

On-the-job training (OJT) refers to training conducted at the job site. Virtually every assignment involves some measure of OJT, which usually takes place upon an individual's arrival at the duty station. OJT programs range from formal, with detailed objectives and requirements as well as close supervision, to informal, which entail assigning individuals to jobs in which they learn from experience or from their colleagues.

TABLE 5-7

Student Manyears of Military Training Provided, Fiscal Year 1982, by Component and Major Training Category

	Recruit Training	*Army One-Station Unit Training*	*Officer Acquisition Training*	*Specialized Skill Training*	*Flight Training*	*Professional Development Education*	*Total*
Active Forces							
Army	10,484	17,732	4,747	39,044	1,235	2,486	75,728
Navy	14,711	—	6,197	39,968	1,435	1,974	64,285
Marine Corps	8,223	—	258	8,152	607	648	18,311
Air Force	9,136	—	5,960	23,608	2,950	3,663	45,317
Subtotal	42,554	17,732	17,162	111,132	6,290	8,771	203,641
Reserve Components							
Army National Guard	2,756	7,070	45	4,523	91	52	14,537
Army Reserve	3,320	2,374	4	5,044	43	45	10,830
Naval Reserve	318	—	39	668	—	16	1,041
Marine Corps Reserve	1,640	—	260	921	—	14	2,835
Air National Guard	584	—	—	1,290	244	39	2,157
Air Force Reserve	397	—	7	866	78	57	1,405
Subtotal	9,015	9,444	355	13,312	456	223	32,805
TOTAL	51,569	27,176	17,517	124,444	6,746	8,994	236,446

SOURCE: U.S. Department of Defense 1981a.

Formal schooling programs and OJT are described in more detail in the following subsections. The discussion focuses on the general characteristics of training programs in use throughout the military. Training programs are discussed by type, and within that framework each service program is discussed separately, followed by a summary comparing the various service programs. Since the overall focus of this paper is the effect of military training on youth employment, the discussion is limited to training programs for the enlisted ranks. Individuals in officer training programs tend to view the military as a career, and, consequently, the training they receive generally has little effect on youth employment. Marine Corps training is not discussed since it represents a small percentage of the overall training load and often relies on the other services' training organizations.

As mentioned previously, formal military schooling usually takes place at one of the DoD-established training installations. A listing of enlisted training facilities with their FY 1982 student work loads and staffing levels is presented in the Appendix. There are four types of formal schooling including the following:

- Basic Training
- Initial Skill Training
- Army One-Station Unit Training (OSUT)
- Skill Progression Training

Each of these is discussed in the following paragraphs in more detail.

Basic Training

Basic Training, also called Recruit Training, is the basic introductory physical conditioning and military indoctrination training given to all new enlisted entrants in each of the services. It includes processing and testing of entrants; introduction to service life; instruction in military courtesy, discipline, and hygiene; and the fundamental military-related training involving physical fitness, military drill, and self-defense.

Basic Training is designed to provide for the transition from civilian to military life. The services require a high level of discipline, the ability to function in a structured environment, and a certain homogeneity of outlook on the part of the individual members. Basic Training works toward meeting these requirements. In addition, it strives to instill self-confidence and a sense of pride in being a member of the armed forces.

Basic Training represents one of the larger components of the military training system. Table 5-8 presents the personnel statistics for FY 1982 Basic Training.

TABLE 5-8

Training Entrants, Graduates, and Student Manyears of Training Provided, Recruit Training, FY 1982

Service Component	*Entrants*	*Graduates*	*Student Manyears*
Army:			
Active	68,211	62,527	10,484
Reserve	22,345	20,611	3,320
National Guard	17,942	16,518	2,756
Navy:			
Active	98,448	90,978	14,711
Reserve	2,008	1,798	318
Marine Corps:			
Active	39,984	35,455	8,223
Reserve	7,800	6,856	1,640
Air Force:			
Active	73,800	69,003	9,136
Reserve	3,204	2,996	397
National Guard	4,719	4,412	584
DoD:			
Active	280,443	258,263	42,554
Reserve/Guard Total	58,018	53,191	9,015
DoD Total	338,461	311,454	51,569

SOURCE: U.S. Department of Defense 1981a.

Little skill training is conducted in Basic Training, but each service does provide a certain degree of conditioning in military skills that should be possessed by almost all members of that service. This results in differences among the services in the length of Basic Training. The number of weeks spent in Basic Training for each service is summarized in table 5-9.

TABLE 5-9

Basic Training Course Length FY 1982
(Weeks)

Army	*Navy*	*Air Force*
7.6	7.7	6.0

SOURCE: U.S. Department of Defense 1981a.

Air Force Basic Training is considerably shorter than that of the other services because it concentrates mainly on indoctrination and physical conditioning. It offers little in the way of service-wide skills since few Air Force jobs require common skills. Army Basic Training involves intensive physical conditioning and instruction in basic ground combat skills, including the use of individual weapons. For FY 1982 the Army lengthened its Basic Training program by one week. The Navy course, in addition to the indoctrination components, includes training designed to prepare recruits for living, working, and fighting under restricted space conditions and in close proximity to complex machinery and weapons, characteristics common of a fleet environment.

Upon completion of Basic Training, individuals will pursue one of three possible paths. First, and most likely, they might enter initial skill training, which is designed to prepare enlistees for their initial duty assignment. Second, an enlistee might be assigned to a first-duty unit for on-the-job training. Third, but highly unlikely, an individual might be assigned to direct duty on the basis of a skill previously acquired in civilian life.

Initial Skill Training

Initial skill training for enlisted persons normally follows Basic Training and includes all formal training that leads toward a military occupational specialty (MOS) or other rating at the lowest skill level. It is the most basic level of military specialized skill training, and might serve as the foundation for further training, or provide all necessary training for a particular job assignment. Given the large number of military occupations, skill training is very diverse and represents the largest portion of military training manyears and expenditures.

Nearly all enlisted recruits need some measure of skill training to be qualified to perform the job required of them. Most service recruits are drawn from the least skilled segment of the population. These individuals generally are educated to the high school diploma level or lower and possess little in the way of job experience, or they have experience that is not applicable to military jobs. Although it is possible in some cases to assign such individuals to duty stations for on-the-job training, the services' officials believe the majority of skills are most effectively and efficiently learned through formal courses. Most enlistees progress from Basic Training to initial skill training. Table 5-10 presents the personnel statistics for initial skill training for FY 1982.

The number and complexity of courses taught vary according to the mission of the individual service. The courses conducted at any one time are determined by service requirements, which are derived ultimately from basic national security objectives.

All military training is designed through what are referred to as Instructional Systems Development (ISD) procedures. ISD entails selection of the tasks required for each skill and identification of the skills required for each job. Its purpose is to determine the best means of teaching the various skills.

The services have differing approaches to initial skill training. Each service program is described in the following sections.

Army Initial Skill Training. The Army's initial skill training, somewhat misleadingly called Advanced Individual Training (AIT), is provided to virtually every enlistee upon completion of Basic Training. The major exceptions made are for those individuals enrolled in Army One-Station

TABLE 5-10

Training Entrants, Graduates, and Student Manyears of Training Provided, Initial Skill Training (Enlisted), FY 1982

Service Component	*Entrants*	*Graduates*	*Student Manyears*
Army			
Active	102,885	92,433	19,314
Reserve	19,382	17,464	3,110
National Guard	19,901	18,417	3,421
Navy			
Active	163,857	154,994	20,118
Reserve	3,902	3,713	428
Marine Corps			
Active	45,573	42,140	5,604
Reserve	6,827	6,443	838
Air Force			
Active	74,202	67,750	15,801
Reserve	4,747	4,493	729
National Guard	5,973	5,646	1,032
DoD			
Active	386,517	357,317	60,837
Reserve/Guard Total	60,732	56,176	9,558
DoD Total	447,249	413,493	70,395

SOURCE: U.S. Department of Defense 1981a.

Unit Training, which includes initial skill training for participants and certain reservists. One-Station Unit Training is described elsewhere. Reservists might bypass AIT through participation in the Civilian Acquired Skills Program. This program, which is not available to active-duty enlistees, allows individuals credit for civilian training in certain MOS classifications.

For FY 1981, it is projected that the Army will offer 243 courses classified as initial skill training. A sampling of the courses having the largest enrollments of those to be conducted in FY 1982 is presented as follows:*

- Basic Medical Specialist
- Administrative Specialist
- Food Service Specialist
- Supply Specialist
- Equipment Records and Repair Parts Specialist
- Motor Transport Operator

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*Much of the Army's high-density skills training and combat skills training (armor crewperson, artilleryperson, etc.) will be offered through One-Station Unit Training (OSUT) in FY 1982 (U.S. Department of Defense 1981a).

AIT is job specific and provides training at a level somewhat below an apprentice level. Course lengths can range from seven weeks to two years, but the bulk of courses are between seven and eleven weeks long. AIT involving long training periods, such as the two-year language training, generally requires an extended service commitment.

Given that AIT is job oriented, the training methods tend to be simulation and demonstration. Class size averages around ten students but might have as many as twenty to twenty-five students. It is rare for an AIT class to be much larger.

With few exceptions, AIT is the only formal training provided to individuals during the course of their first enlistment. The Army's general policy is that a person must demonstrate more of a commitment to an Army career before extensive training will be provided.

After AIT, individuals are assigned to their initial job. It is up to the job supervisor to provide the necessary OJT to enable the individual to perform the required duties. A shortage of qualified noncommissioned officers (NCOs) has created some problems in this area. These problems will be discussed under OJT.

Navy Initial Skill Training. The Navy has the most "schoolhouse" oriented training system of all the military services. Navy circumstances are such that there is not a great deal of on-the-job training. Space requirements demand that as much training as possible be given before assignment. Navy initial skill training immediately follows Basic Training.

The Navy operates two major types of initial skill training. These are (1) apprenticeship training and (2) "A School" training programs. Apprenticeship training is relatively low-skill training given in four fields: Fireman, Airman, Seaman, and Constructionman. This training, which lasts approximately four weeks, provides the basic parameters of the respective fields. Successful completion of apprenticeship training leads directly to assignment. Given the limited skill characteristics of this training, it generally is provided to enlistees who have demonstrated lower mental aptitude or skill capabilities. Approximately 25 percent of Navy Basic Training graduates are assigned to apprenticeship training.

The remaining 75 percent of Navy Basic Training graduates are assigned to one of the A School training programs. Before actually beginning A School, most training candidates are required to complete a Basic

Electricity/Electronics (BEE) program tailored to their individual functional areas. This is computer-managed instruction consisting of a certain number of "modules" of study. The number of modules taken, and consequently the length of the BEE course, varies according to the functional area the individual is pursuing. BEE training averages approximately nine weeks.

Immediately upon completion of BEE, an enlistee enters A School training. A School might be as short as six weeks, but it can last as long as a year, depending on the field of concentration. Most courses are between six and seven weeks in length. This is rather short as compared with the other services, largely because Navy personnel, to a greater extent than the other services, receive supplementary formal training during their first enlistments.

The Navy's projection for the number of initial skill training courses to be offered during FY 1982 is 165. This includes apprenticeship training and BEE programs. In addition to these two basic programs, some other Navy initial skill training courses are as follows:

- Aviation Fundamentals
- Propulsion Engineer Basic
- Basic Enlisted Submarine

The Navy uses a variety of instructional methods to conduct training, but most A School and other courses are conducted in the traditional lecture and testing format. Navy officials believe that lecture is the most efficient means of transmitting knowledge and that testing provides a good means of measuring the required skill mastery.

The BEE programs, as mentioned previously, are taught using individualized computer-managed instruction (CMI). Approximately 15 percent of A School courses also are taught in this manner. Basically, CMI is an automated testing process. Upon completion of a study module (generally reading oriented) an individual takes a test, which is computer scored. Once the test is scored the computer instructs the student either to proceed to the next module or to restudy certain specific topics.

Successful completion of A School training results in the awarding of an A School rating. This rating, of which there are roughly 80, signifies that individuals have completed the primary education process for their discipline. Depending on the requirements of their job, an individual might be assigned either directly to a duty station, or might proceed to further skill training.

Air Force Initial Skill Training. The Air Force has a highly structured on-the-job training program and tends to focus its training efforts in that direction. However, initial skill training is generally in the form of formal course work.

Almost all Air Force enlistees proceed immediately from Basic Training to an initial technical training course. Those who do not (approximately 5 percent of all Air Force Basic Training graduates) are assigned directly to career fields in which it has been determined that participants have no need for formal skill training. These jobs tend to be the least technical and have the lowest skill requirements.

The enlistees who require initial skill training are assigned to a formal resident training course that can last from three to fifty weeks. The average length of Air Force initial skill training is eleven and one-half weeks, the longest average of any of the services.

For FY 1982, the Air Force is projected to conduct 280 initial skill training courses including the following:

- Security Specialist
- Aircraft Maintenance Specialist (Tactical)
- Aircraft Maintenance Specialist (Airlift/Bombardment)
- Administrative Support Staff Specialist
- Inventory Management Specialist

Training methods vary according to the nature of the subject matter. However, the Air Force emphasis on OJT results in a hands-on orientation that carries through the formal schooling. Where appropriate, training is conducted through demonstration and simulation, although lecture methods also are used. The Air Force has made limited use of computer training methods but has found that constant requirements for updates of software are excessively expensive. If more cost-effective training means exist, they generally are chosen over computer training methods. Computer training methods are, for the most part, limited to fields that require the use of computers.

Successful completion of initial skill training results in the classification of enlistees as "Level 3" within their occupational category. This is the lowest skill classification and is considered somewhat below an apprentice level. After Level 3, most training is conducted in an OJT fashion.*

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*Although most further Air Force training is in the form of OJT, formal course work does take place. An enlisted individual usually receives three to four formal courses (other than initial skill training) during a twenty-year career.

General characteristics of initial skill training. Like Basic Training, initial skill training in the various services has many features in common. Almost all enlistees receive some sort of initial skill training following Basic Training, and it is usually conducted through formal schooling. The exact nature of the training differs depending on the mission of the service and the complexity of its job requirements. The services differ in terms of whether initial skill training serves as an end in itself or as a foundation for further training. For Army enlistees, initial skill training is generally the only formal skill schooling that they will receive during the course of the first enlistment. Other formal schooling, if any, occurs after an individual reenlists. For a sizable percentage of Navy personnel, initial skill training is the first step in the Navy's highly formalized, specialized skill training structure. It is not uncommon for enlisted persons to receive supplemental formal schooling, even during the first enlistment. In the case of the Air Force, further training, which is quite extensive, is generally conducted through a well-organized OJT program.

Army One-Station Unit Training (OSUT)

The Army's One-Station Unit Training (OSUT) is a program that combines the features of Basic Training and initial skill training. Approximately 50 percent of all Army enlistees enter military specialties through OSUT. This program is not presently available for all occupations. It is limited to the combat arms (infantry, artillery, engineers, armor) and Military Police (MP) training.

The characteristics of OSUT are essentially the same as those of the Basic Training and initial skill training it replaces; however, the one-station aspect allows savings in training time and as a result, savings are realized in training resources. In the past, Basic Training and initial skill training together averaged approximately sixteen weeks including the time required to move the trainee from one training installation to another. OSUT course lengths average thirteen weeks.

OSUT personnel statistics for FY 1982 are detailed in table 5-11.

Skill Progression Training

Skill progression training provides military personnel with higher levels of skill in military specialties to match specific job requirements.

TABLE 5-11

Training Entrants, Graduates, and Student Manyears of Training Provided, OSUT, FY 1982

Service Component	*Entrants*	*Graduates*	*Student Manyears*
Army			
Active	67,334	60,151	17,732
Reserve	8,856	8,024	2,374
National Guard	27,556	24,957	7,070
Reserve/Guard Total	36,412	32,981	9,444
DoD Total	103,746	93,132	27,176

SOURCE: U.S. Department of Defense 1981a.

Enlisted personnel in most cases advance in their skill areas through job experience or through OJT. When additional schooling is conducted, it is generally after an individual has demonstrated some commitment to a service career, such as a second enlistment.

The exception to the general lack of first enlistment formal training (other than initial skill training) is in the case of the Navy. The Navy maintains a rather extensive network of C Schools, where training is designed to qualify students for Navy Enlistment Classifications (NECs) required for certain jobs. It is not uncommon for C School training to immediately follow A School training. In addition, there are Navy F Schools that conduct training on an as-needed basis for particular jobs. F Schools do not necessarily represent a higher plane of training. Rather they provide specific, task-related technical training concentrating primarily on operational aspects of a job.

Table 5-12 presents FY 1982 projected personnel statistics for enlisted skill progression training. Caution should be exercised in interpreting these figures since it is not clear exactly what is included in terms of OJT. Certain highly structured OJT programs, such as those of the Air Force, might be included; but less structured OJT, such as much of the OJT conducted in the Army, might be excluded.

TABLE 5-12

Training Entrants, Graduates, and Student Manyears of Training Provided, Skill Progression Training, FY 1982

Service Component	*Entrants*	*Graduates*	*Student Manyears*
Army:			
Active	17,791	16,580	3,467
Reserve	3,183	2,920	353
National Guard	1,653	1,560	206
Navy:			
Active	79,550	74,880	11,423
Reserve	306	301	13
Marine Corps:			
Active	5,747	5,299	1,155
Reserve	446	427	55
Air Force:			
Active	65,211	63,665	5,669
Reserve	1,538	1,543	68
National Guard	3,404	3,054	183
DoD:			
Active	168,299	160,424	21,714
Reserve/Guard Total	10,530	9,805	878
DoD Total	178,829	170,229	22,592

SOURCE: U.S. Department of Defense 1981a.

On-the-Job Training (OJT)

As previously discussed, OJT is training conducted at the job site. Its exact definition varies among the services and, to some extent, within each service. An individual service's definition of OJT may cover some or all of the following learning situations:

- Learning by doing
- Planned and managed OJT
- Training through schools in the field
- Contractor training (U.S. Department of Defense 1981b)

Learning by doing is simply what its name implies: learning the performance of tasks through actual experience. It may or may not include a training plan and progress standards, but this sort of training generally is supervised.

Planned and managed OJT uses task lists and standards, instructional media, and more structured training techniques. The training usually is conducted by the trainee's immediate supervisor in the course of the performance of duties associated with the individual's assigned job. This sort of OJT might replace formal schooling, but it generally is used as a supplement or complement to other course work. This sort of OJT also might be used to accomplish skill upgrading or the conversion from one occupational specialty to another.

Training through schools in the field is accomplished either through permanent, centrally authorized schools, field-commanded schools, or one-time courses. This sort of training is similar in many ways to formal schooling, but because it is conducted in the field, it is considered OJT.

Contractor training is similar to training through schools in the field, the major distinction being that it is conducted by a contractor, frequently the equipment producer in the case of equipment use training. Contractor training tends to be done as needed, rather than on a regular basis.

It is apparent that OJT involves a wide range of training programs. Separate statistics on the training loads and costs of OJT are not available since they are included either in formal training or absorbed in general supervisory budgets. A 1976 study focusing on the efficiency of OJT describes a methodology for estimating the costs of OJT (Gay and Albrecht 1978). The study defines the net cost as the difference between pay and allowances received by individuals and their net productivity.

There is real cost realized by the military if pay and allowances exceed an individual net productivity. A previous study (Gay 1974) that used the same methodology estimated that the costs associated with informal OJT might amount to as much as $1.5 to $3.0 billion for enlisted specialized skill training alone.

OJT programs are used by all the services, but the extent to which OJT is used and the specific types of OJT vary from one service to the next. Each service's OJT program is described in the following sections in more detail.

Army OJT. The Army defines OJT as "a training process whereby students or trainees acquire knowledge and skills through actual performance of duties, under competent supervision, in accordance with an approved planned program" (Gay 1974). Army OJT is directed toward bringing new graduates of initial skill training, and other formal training programs, up to productive status (defined as Skill Level 1). Nearly all graduates of formal skill training require OJT to become fully productive.

Army OJT is planned and managed OJT in the sense that documentation that describes what must be learned and the means of teaching it is available to supervisors. In practice, Army OJT appears to be less than standardized, although the Army is presently working to improve in this area. Training usually is conducted by a trainee's NCO supervisor.

In recent years, a shortage of qualified NCOs has made it necessary for the Army to modify its general OJT orientation and to conduct formal training through schools in the field. These "shadow" schools are formed on an ad hoc basis and are designed to train large numbers of individuals where a shortage of supervisors prohibits OJT. Since these schools are designed to alleviate a specific local need, they are commanded at the unit level and use varying training methods.

The Army also has made use of contract training where necessary and feasible. This sort of training generally is related to specific equipment or is in fields that also exist in the civilian sector.

Navy OJT. Generally referred to as "on-board training," Navy OJT is defined as "training in the actual job situation during daily operations" or as "any preplanned use of work resources in the work environment primarily for the purpose of training someone to produce work" (Gay 1974).

Most Navy OJT actually is taught through formal courses conducted at the Navy's Fleet Training Centers, generally located in the vicinity of major home ports. The largest of the Fleet Training Centers are at Norfolk, Virginia and San Diego, California.

It is difficult to generalize about methods used in Navy OJT since considerable differences exist depending on the nature and the subject material. What distinguishes on-board training from formal skill training is that on-board training generally encompasses operative skills with little focus on general field-specific knowledge.

Little OJT is conducted at the actual duty station (i.e., on board ship), because of the limitations in time and space while at sea. What training is conducted in this mode is generally indigenous to a particular ship.

Air Force OJT. The Air Force has the most highly structured OJT program of all the services. After completion of initial skill training, individuals are assigned to their duty location. Simultaneously, these enlistees enter the Air Force OJT program, which is a continuous training process.

The Air Force defines OJT simply as the training received by enlistees while they are performing in an Air Force specialty at their duty location (U.S. Department of the Air Force 1979). The OJT system itself is a dual channeled training process, the two channels being a Career Knowledge channel and a Job Proficiency Training channel.

The Career Knowledge channel consists of a series of prescribed self-study, correspondence-type courses. Enlistees take these courses at the Air Force installation at which they are assigned, and upon completion they arrange for taking examinations.

The Job Proficiency Training channel is designed to make certain that enlistees are qualified to be independently productive in their respective job positions. This training is supervisor conducted and evaluated. It uses centrally developed training standards and job proficiency guides that describe the knowledge and tasks to be learned.

Air Force Regulation 50-23 ("On-the-Job Training") provides training supervisors with the guidelines for administering an OJT program. In addition, most Air Force installations include a Field Training Detachment (FTD), local operational training units assigned to and controlled by the Air Training Command. This serves as an additional resource for OJT supervisors.*

General characteristics of military OJT. The services have differing approaches to OJT, and consequently, it is difficult to generalize about its structure and content. However, all the services provide some measure of OJT, ranging from well-defined programs, such as those of the Air Force, to more informal programs, such as those of the Army. The Army and the Air Force both use OJT more than does the Navy. Navy on-board training tends to be indigenous to a particular ship, or is in the form of more structured courses than the OJT of either the Army or the Air Force. The Air Force views OJT as continuous training, whereas it appears that the other services tend to view OJT as directed toward the performance of a particular job.

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*The FTDs also provide formal courses at the operational level. An Air Force official stated that there are approximately 140,000 entries per year into FTD courses.

The Structure of the Military Training Establishment

It was mentioned earlier that each of the individual services operates its own training structure that exercises primary responsibility for the detailed management of military training. Each of the services, with the exception of the Marine Corps, has a training commander who reports directly to the service chief. This individual, a top-level military officer, is responsible for most of the individual training conducted within that service. The training command manages most service military schools, training centers, and other training facilities.*

The Army's training command headquarters is Headquarters Training and Doctrine Command (TRADOC) located at Ft. Monroe, Virginia. TRADOC oversees training installations and school commanders located throughout the United States.

Navy training is commanded by the Chief of Naval Education and Training, who is based in Pensacola, Florida. This command administers the Fleet Training Centers, and training schools and programs conducted throughout the Navy.

The Air Force training administration, the Air Training Command, is located at Randolph Air Force Base in Texas. It commands the individual training centers as well as the field training detachments located at most Air Force installations.

The role of the Office of the Secretary of Defense (OSD) with regard to training is one of policy development and coordination, and allocation of resources. This responsibility rests with the Assistant Secretary of the

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*In the case of the Marine Corps, commanders of the various training activities report directly to the Commandant of the Marine Corps and deal directly with headquarters training staff.

U.S. Department of Defense (Manpower, Reserve Affairs, and Logistics), although the Assistant Secretary of Defense (Comptroller) exercises influence over the allocation of resources. Each of the service headquarters also maintains a policy-oriented unit responsible for military training.

The organization of the training establishment is such that the individual services conduct their training programs largely in an independent manner. OSD responsibilities are to provide general mandates within which the service training commands operate.

THE IMPACT OF MILITARY TRAINING

Many studies have been conducted that pertain in one way or another to military training. Only a few, however, have examined the broader topic of military training's relationship to and impact on society at large. This section provides an overview of recent work that has been performed regarding the effects of military training on the job experience of separatees, and summarizes a number of specific studies dealing with this topic.*

The discussion that follows is divided into three subsections. The first concerns what is known about the relationship between military training programs and civilian training programs. For example, to what extent have such civilian training programs as CETA and the Job Corps been used by the military to recruit new enlistees? How have civilian training institutions built on the knowledge and skills that youth have acquired in the military? The second subsection focuses more specifically on the relationship between military training and disadvantaged youth. The last subsection reviews the literature with respect to the impact that military training has on the earnings and employment opportunities of those who have served in the military.

Relationship of Military Training to Other Training and Employment Programs

As was discussed in the preceding section, military training programs are designed primarily to meet the needs of the armed forces for skilled personnel. There is, however, considerable overlap between the occupational needs of the services and those of the civilian industrial economy. This has become more pronounced as the technical sophistication of the services has increased. Wool (1959), for example, compared the major military occupational groups from World War II to the late 1950s and discovered a sharp relative expansion of the technical and managerial skill groups at the expense of ground combat, crafts, and service occupations (table 5-13). He attributes the shift in part to the changes in force requirements over this period, but he also attaches great importance to what he terms the revolution in military technology.

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* For a more detailed review of the literature on the returns of military training, see Norrblom (1977).

TABLE 5-13

Percentage Distribution of Enlisted Jobs By Major Occupational Group

Major Occupational Group	*End of World War II*	*During Korean Conflict*	*31 Dec., 1958*
Electronics	6.2	9.6	13.5
Other technical	6.9	6.9	7.4
Mechanics and repairers	21.3	22.6	25.8
Administrative and clerical	15.3	20.8	20.6
Crafts and services	26.7	22.7	19.4
Ground combat	23.6	17.4	12.9
Total	100.0	100.0	100.0

SOURCE: Wool 1959, Table II, p. 166.

It thus can be seen that over recent years, there has been some convergence between military and civilian occupational needs. It would be interesting to study the interrelationship between military training programs and civilian programs. It appears, however that to date, little if any work has been done in this area. The few studies that look at both types of training tend to focus on their relative impact on earnings as opposed to comparing the types of training they provide. Moreover, it does not appear that any studies have addressed the question of whether the civilian and military training systems should be regarded as complements to each other or as two separate and distinct entities.

On the latter point, the existing evidence indicates that the two systems are largely separate. The military trains virtually everyone who enters and relies little, if at all, on civilian skill training programs such as CETA. Individuals with civilian-acquired skills might progress more rapidly than others through the military training structure, but very few individuals bypass it altogether. This could be because the services' officials believe it necessary to provide individuals with training as it relates to the unique mission of the military.

In contrast with the fact that the military appears to rely exclusively on its own training system, there is evidence that some civilian training programs at least accept military training as sufficient for meeting their own objectives. This has resulted largely at the initiative of the services. The Army has developed an apprenticeship program whereby Army training and experience can be applied for credit toward civilian industrial apprenticeship programs. This program does not entail special training; instead it is a series of agreements the Army has worked out with civilian trade unions and other industrial organizations. The program is limited to a relatively small number of occupational specialties (i.e., those having the greatest similarity to their civilian counterparts).

The Air Force has developed a program it calls the Community College of the Air Force (CCAF) whereby college credit applicable toward an associate's degree is earned for all formal Air Force courses and certain OJT and correspondence courses. CCAF credits are accepted by the various civilian college accrediting institutions, and CCAF also is authorized to grant associate's degrees.

Relationship of Military Training to Disadvantaged Youth

An issue of particular importance for social policy concerns the impact of military training on the employment and earnings prospects for disadvantaged youth. In a sense, the reason for this interest is obvious: because the military was an "equal opportunity" employer long before the term became popularized—at least for young men—the military has been seen as a vehicle for helping the disadvantaged enter the mainstream of society. The question that arises, then, concerns the extent to which the military in fact increases the employment and earnings opportunities for disadvantaged youth. This question, in turn, consists of two parts. First, how many disadvantaged youth serve in the military? Second, what is the impact on those who do serve?

This subsection is concerned with the first question; the second question is examined in the last subsection. The following sections will demonstrate that the military's screening, or selection criteria, necessarily screen out some of the most truly disadvantaged. That is, the military's primary purpose is military in nature, not social, and it must accordingly try to recruit the best personnel it can. At the same time, the military still manages to recruit and train large numbers of disadvantaged youth. The discussion first examines the implications of present screening criteria to determine those who serve in the military, and then describes two times in the past when these standards were lowered, thus increasing the numbers of disadvantaged youth allowed to serve.

Current system. In order to understand the impact of the military training system on disadvantaged youth, it is necessary first to define what is meant by the term "disadvantaged" youth and, second, to understand who serves in the military.

The term "disadvantaged" obviously can be defined in many ways. It can refer to youth from racial and ethnic groups in society who are regarded as disadvantaged, such as blacks, Hispanics, Native Americans, and so forth. It can refer to youth from low income families. It can refer to certain individuals who are handicapped, illiterate, uneducated, and so forth. Individuals having any or all of these characteristics might be thought of as "disadvantaged." Thus, rather than settle on any single definition, the discussion that follows will address the implications of the military training system for the various possible definitions.

Recall from the section titled "Overview" that the military uses a variety of screening criteria to determine individuals' mental, medical, and moral fitness for military service. Mental category V (those legally ineligible to serve) and the physically unfit account for about one-third of all eighteen-year-old males. Thus, those who might be thought of as the most truly disadvantaged are not allowed to serve. The reason, of course, is that these individuals are thought not to be suited to the rigorous requirements of military service.

In addition to those legally ineligible to serve, the military limits the number of category IV personnel allowed to join. These individuals account for another 20 percent of the male population. The military also limits the number of women allowed to serve to about 15 percent of annual personnel accessions.

As shown in table 5-14, the military's selection criteria, both mental aptitude and educational attainment, have a differential impact by race. Although blacks comprise about 13 percent of military-aged males, they represent about 50 percent of the mental category V population—i.e., those legally ineligible to serve. And, blacks make up about 30 percent of the category IV population. Thus, proprotionately fewer blacks than whites qualify for military service.

Although proportionately fewer blacks than whites qualify for military service, table 5-15 shows that blacks historically have served in larger numbers than whites relative to their eligible population base. As shown earlier in figure 5-2, blacks today comprise about 25 percent of all enlisted personnel. A growing number of Hispanics also are serving in the nation's military; about 8 percent of Army enlisted personnel are Hispanic and of other minorities.

Thus, although the military's need for qualified personnel results in proportionately fewer minorities qualifying for military service, proportionately more actually serve. For a variety of reasons—less discrimination, greater job opportunities in the military, worse civilian job opportunities, and so forth—the military is an attractive alternative career for many minorities and disadvantaged youth.

The fact that minorities serve in larger proportions in the armed forces makes the issue of the returns to military training even more important from the perspective of social policy. In particular, the general overall experience of having served in the military might positively enhance the future prospects of disadvantaged youth. DeTray (1980) examined whether veteran status might serve as a "screening device" used by employers to separate more productive from less productive workers. Among other things, his findings indicate a positive association between veteran status and civilian earnings. This "veteran premium" is observed to be greater for blacks than for whites and to be higher for individuals having fewer years of schooling, thus suggesting that successful military service has a "certification" effect for young blacks in the civilian job market.

Project 100,000. Twice during the past twenty years, once deliberately and once inadvertently, the military accepted young men into the service who normally would have been rejected. As previously noted, although category IV individuals are legally eligible to serve, the services

TABLE 5-14

Mental Category and Educational Attainment Distribution by Race, 1971-1972 (percentage)

	Nonblack	*Black*	*Total*	*Black as a percentage of total*
Mental Category[a]				
I	8.1	0.2	7.2	0.4
II	38.5	4.5	34.5	1.5
III	37.0	26.6	25.8	8.8
IV	12.3	39.7	15.5	30.2
V	4.1	29.0	7.0	48.7
Total	100.0	100.0	100.0	11.8
Educational Attainment[b]				
HSG	72.6	50.4	70.0	8.5
NHSG	27.4	49.6	30.0	19.5
Total	100.0	100.0	100.0	11.8

SOURCE:

[a] Distribution for preinductees examined in 1971-1972 as reported in Cooper 1977.

[b] Distribution for eighteen to twenty-one-year-old males for 1972 as reported in *Current Population Reports*, Series P-20, Number 274.

TABLE 5-15

Participation Rates for Category I-III Blacks and Non-Blacks (percentage)

	Participation Rate	
	Nonblack	*Black*
1958-63	43%	83%
1964-68	44	73
1969-70	34	54
1971-72	24	53
1973-75	18	49

SOURCE: Cooper 1977.

NOTE: Participation rate defined as number of category I-III enlisted accessions divided by number of category I-III male eighteen-year-olds.

historically have limited the numbers of such individuals actually allowed to join, for example, by requiring category IV applicants to score average or above average on one or more portions of the aptitude test. The practical result of these restrictions has been to all but eliminate category IV accessions—that is, those falling in the tenth to sixteenth percentile of the mental aptitude spectrum.

In the mid-1960s, the DoD initiated what is referred to as "Project 100,000" whereby approximately 100,000 young men who otherwise would have been rejected for military service instead were accepted each year between 1966 and 196[illegible]. The purpose of this experiment, which was initiated by President Lyndon Johnson and Secretary of Defense Robert McNamara, was twofold: (1) to determine the extent to which marginally acceptable young men in fact could make a useful contribution to the nation's defense, thereby increasing the size of the human resource pool that the military could draw upon, and (2) to determine the extent to which military service could ease the way into productive civilian employment for these individuals. In other words, the purpose of this experiment was both military and social in nature.

The second "experiment" was quite inadvertent. As noted earlier, the DoD discovered in 1980 that the tests used to determine individuals' acceptability for military service had been misnormed. The result of this misnorming was that the services accepted many more category IV personnel—particularly categories IVB and IVC—than previously had been thought. Indeed, the renormed test results indicate that more than 30 percent of FY 1980 enlistees fell into category IV, as opposed to the 10 percent or so that the misnormed test results suggested. The individuals accepted into the military as a result of this misnorming thus constitute a "natural experiment."

Unfortunately, there is relatively little documentation of the Project 100,000 experience. There are a number of microstudies reporting the results from particular experiments under the Project 100,000 umbrella, such as the effectiveness of particular training approaches for small groups of Project 100,000 recruits. There are also summary reports regarding the performance of the so-called "New Standards Men" in the military, according to such measures as the proportion successfully completing training, attrition rates, and promotion rates. New Standards Men did not perform quite as well on the average as other recruits, but they were not very different from those falling just above the previous cutoff point. Despite these summary reports, however, there was relatively little of what might be described as broader policy analysis of the Project 100,000 experience. And, we have little evidence regarding the postservice employment experience of Project 100,000 recruits as compared with other recruits. As a result, much of what is known about the results of Project 100,000 rests with those researchers and military personnel who were personally involved in the experiment.

Opinions about the success of Project 100,000 are mixed. Some view the experiment as unsuccessful; others contend that the military did not allow it to succeed. In this regard, the military's concern was twofold. First, it was not that all Project 100,000 recruits were necessarily bad, for some such recruits performed more than satisfactorily. Rather, the concern was that too many Project 100,000 recruits failed to perform satisfactorily—that is, a higher proportion of them were unsatisfactory than were the other recruits. Unfortunately, though, the evidence needed to evaluate the validity of this concern is simply too sparse. Second, and perhaps more important, the military claimed that Project 100,000 recruits required much more training, time, and attention than other recruits—time and attention that took away from maintaining military readiness. In other words, the military claimed that this social function—i.e., training marginally acceptable men—came at the expense of military effectiveness.

Perhaps the single most important result to emerge from Project 100,000 concerns the effectiveness of alternative training methods. Specifically, lower mental aptitude recruits did not perform as well as higher mental aptitude recruits in traditional lecture and paper-and-pencil training, as would be expected. The performance of lower mental aptitude recruits improved measurably, however, when the training approach was altered to rely more on hands-on and performance-oriented training. Particularly important was the combination of this training approach with criterion reference testing, whereby clear-cut performance goals are specified at the outset. Although the importance of taking a more hands-on, less lecture-oriented training approach for lower mental aptitude recruits might seem obvious in retrospect, it took Project 100,000 to clearly demonstrate this fact. Indeed, this approach has been transferred successfully to adult vocational education.

Project 100,000 was also the spark for such other training innovations as self-paced instruction and peer training. It was not that any of these innovations, including hands-on training or criterion reference testing, were altogether new, but rather that Project 100,000 provided the laboratory for further establishing many of these concepts.

Thus, probably the most important consequence of Project 100,000 had little to do with the avowed purpose of establishing the usefulness of marginally acceptable personnel for the military or of using the military as a vehicle for transmitting disadvantaged youth into the mainstream of society. The evidence is simply too fragmentary to evaluate the experiment in either of these regards. Rather, the most important consequence is probably that Project 100,000 opened the eyes of military officials to the value of alternative training concepts and approaches.

Turning to the more recent "experiment" of the marginally acceptable recruits—i.e., recruits accepted because of the misnorming—it is obviously too recent to draw any conclusions. However, it should be noted that this inadvertent experiment provides an important opportunity for researchers to evaluate some of the original questions that were to be addressed through Project 100,000.

Effects of Military Training on Job Experience

It was mentioned earlier that there has been an observed convergence between military and civilian occupational needs. Based on this, studies have sought to document and estimate the military contribution to an individual's civilian career training needs. As Norrblom (1977) points out, these studies can be divided into two groups:

- Those that study the extent to which individuals use military-acquired skills in civilian jobs
- Those that focus on the economic effect of military training

The first group of studies generally is characterized by methodologies that (1) evaluate the opinion of separatees about the degree to which they use the skills acquired while in the military in their civilian jobs, or (2) consist of cross-tabulations of individuals' military occupational codes with their civilian occupational codes.

The second group of studies takes a human capital approach in that these studies attempt to test the significance of the military contribution to an individual's overall economic situation. Human capital theory explains inequalities in labor income in part by pointing out differences in the investment of individuals in training. Training is regarded as something that increases productivity, and therefore, wages. This framework focuses on wages, comparing individuals' investments in training with their earnings subsequent to completion of training to determine if the investment yields returns to the recipients. Most of the recent studies are of this type.

Biderman (1969) performed a study of the first type that investigated the postretirement careers of a sample of veterans and their relationship to the active duty career of these individuals. The primary sample consisted of career military personnel who retired at the end of May 1964. Data were collected in three phases over a one-year period through questionnaires administered and reports received from the respondents. In addition to the sample, data also were collected from selected items from a survey of retired military personnel conducted by the Department of Defense in 1963.

Biderman's analysis related military skills to civilian jobs on the basis of job title rather than job description. Consequently, it is difficult to assess the relationship on any but the most superficial level. The job title comparisons, however, indicate close relationships between a civilian job and military occupational specialty only in a minority of cases. The relationships were shown to be more pronounced among enlisted men than officers, which Biderman explains is due probably to the fact that the duties of officers tend to be administrative or managerial rather than technical-skill oriented as are most enlisted jobs. However, even among enlisted persons, the study found little in the way of close correspondence between military specialty and civilian job. The findings indicate that no more than one-third to one-half of the sample had moved into directly comparable civilian jobs. This is the case even in those military specialties where transferability would seem to be most likely, such as medical and dental specialists or electronic and electrical repairers.

Not surprisingly, Biderman's study indicates that individuals whose military job specialties had a direct civilian counterpart with a shortage of employees were placed most easily in their own fields. This, however, does not necessarily indicate any higher value placed on military training relative to any other employment evaluation factors. Rather, it is concluded that a veteran is evaluated in common denominator civilian terms, such as education and personal characteristics, rather than on the basis of military-acquired training.

The majority of other studies of the same type as Biderman's support his conclusion that military training generally is not transferable to the civilian economy. However, the findings of the various studies might vary according to the choice of specialties examined, the method used to determine a "match," and the timing of the study. Moreover, these studies overlook the fact that individuals may *choose* a second career that is different from their military occupation. Finally, many of the studies are based on subjective opinion-type data provided by a large number of people, which can result in inconsistency among the individual responses.

The most Biderman's and other research of this nature indicates is that there *might* be a modest transferability of military training to the civilian job market in the more technical occupations. Nevertheless, the general conclusion is that, on the whole, military training does not transfer to civilian jobs. The methodology employed, however, makes the findings far from conclusive.

Studies considering the economic effects of military training generally use quantitative methods to estimate the military contribution. Norrblom (1976) and others have examined the economic and statistical significance of military training in explaining differences in the post-service wages of separatees. Norrblom's approach differs from others in that her hypothesis is that investments in different types of military training have a significant effect on productivity and thus on wages *if* individuals are employed in civilian occupations in which they are able to use skills acquired during their military service. Most studies do not make this distinction since they consider only the length of time spent in "training," as measured by time spent on active duty, and make no distinction as to the nature of the training provided or its relation to an individual's civilian occupation.

Norrblom's analysis is based on a cross-sectional sample of veterans surveyed in 1971 by the Department of Defense. The survey was made up of separatees who served one term of active duty and who completed their military service in FY1971. From this, a subsample was selected and a complete work history was constructed, based on coding from individual records, for each respondent.

In contrast with many previous studies that indicated no significant impact of military training on civilian earnings, Norrblom's findings support the economic and statistical significance of military training on subsequent civilian wages. Formal military vocational training, defined as skills acquired in academic or vocational institutions, is observed to have a significantly positive effect on postservice wages *if* individuals enter civilian jobs related to their military specialties. Such separatees were observed to receive 11.8 percent more per hour for an additional year of formal military vocational training than did those who did not acquire related military training. On-the-job training, on the other hand, did not have a positive effect on postservice earnings. Formal military training in a specialty that is not comparable to an individual's post-service occupation also does not have a positive effect on earnings.

Norrblom explains the difference between her results and others' by pointing out that other studies fail to make use of information as to the type of training received. When length of time spent on active duty is used as a proxy for measuring military training, results generally indicate that there is no significant effect of such training on civilian earnings. The results of Norrblom's study point to the importance of specifying (1) the nature of training received and (2) its relation to one's civilian occupation in order to enhance the possibility of an accurate assesement of the effect of military training.

Trost and Warner (1979) present an alternative human capital approach to assessing the impact of military training on civilian earnings. They point out that a methodology such as that employed by Norrblom might contain two self-selectivity problems that would flaw the results. These problems are as follows:

- Some veterans choose to work in related civilian jobs whereas others do not. Most studies treat occupational choice as exogenous, but it really should be regarded as endogenous.
- Service jobs are assigned largely to individuals rather than being selected by them. Unobservable factors (such as the availability of jobs) might affect job and training assignments.

Both of these problems can distort postservice earnings comparisons. Trost and Warner present a procedure that is designed to correct for both of these selectivity problems and to provide unbiased estimates of the effects of military training.

For simplicity, the authors considered only electronics training. Their sample consisted of enlisted veterans who left the service in FY 1969 after one term. Earnings data were drawn from social security earnings records. The sample was divided into four groups: (1) those who received military electronics training and also took civilian jobs in electronics, (2) those who did not receive electronics training while in the military but took civilian jobs in electronics after leaving (3) those who received military electronics training but did not take civilian jobs in electronics, and (4) those who neither received electronics training nor took civilian jobs in electronics.

Based on the results of a regression technique that takes into account selectivity bias, Trost and Warner found that much of the wage differential that other studies attribute to military training can be explained by selectivity bias. Consequently, they conclude that, *relative to other forms of training*, military training does not appear to yield a wage premium.

On the question of whether military training makes any contribution to human capital, Trost and Warner found that the results are mixed. Their results indicate that only about 16 percent of recipients of military electronics training take similar jobs in the civilian economy. Utilization of skills is thus low, a finding supported by others who have studied the effects of training on veterans who served one term of enlistment. However, it appears, based on the results of this study, that military training might substantially improve the earnings of those who use it in their civilian occupations. Among the low and median education/mental ability groups who received training and used it in the civilian sector, it was demonstrated that these individuals earned from 7.4 to 12.9 percent more than individuals who neither received training nor were in a job that required it. This generally is consistent with Norrblom's findings.

It can be seen that the findings of studies on the economic returns of training indicate that effects are job specific. That is, individuals who use their vocational training appear to receive earnings premiums, whereas those who do not use it appear to earn no premiums. The previously discussed studies focus on short-term effects, but similar results are obtained from studies on long-term effects. Fredland and Little (1980) present long-run evidence of the effects of military vocational training. Using National Longitudinal Survey data from a sample of mid-career white male workers who received military vocational training in World War II and immediately thereafter, the authors found strong evidence to suggest that those who use their military vocational training receive long-term premiums. In fact, they believe that their results are stronger than those of most short-term studies. Like the others, Fredland and Little found the results to be job specific. They also offer evidence that indicates the results of civilian training are stronger than those of military training. This could illustrate that military training is not completely transferable to the civilian economy.

In a similar vein, Cooper (1981b) discounts previous studies contending that military career retirees have lower earnings and poorer employment prospects than their civilian counterparts. Using 1977 data, he presents evidence to indicate that military retirees fare better in terms of employment and earnings than other research indicates, primarily because other studies used data made up disproportionately of recent retirees. Cooper discovered a "transition period" between military and civilian life during which retirees do not earn as much as comparable civilians, but his findings indicate that, after five to ten years, veterans earn about as much or more than their civilian counterparts. Nominal wages for military retirees may be lower than for civilians, but this can be explained by the fact that veterans on the average *voluntarily* work fewer hours than their peers (most likely as a result of military retirement pay). Cooper's findings also indicate that individuals' type of military occupation might affect their postservice earnings. In this regard, he distinguished on the military side only between "combat" and "noncombat" occupations, and found that the earnings discrepancy was rather small (only about $1,000 per year). However, he found that retirees who indicated that their postservice jobs were similar to their military occupations (about half the sample) earned substantially more—about $5,000—than those who indicated little relation between the two.

Recent evidence thus suggests that military training might have positive effects on the job experience of individuals who make use of the specific training received. Premiums do not appear to accrue from the more general aspects of military training. Rather, use of the actual skills in which training was received appears to be a requirement for realization of earnings premiums from military training.

One final aspect deserves comment. Most of the studies conducted to date have relied on draft-era data, when individuals were generally assigned to jobs, irrespective of their preferences. The fact that these individuals do not appear to have gained much relative to nonveterans in the civilian job market thus should not be viewed with surprise. Indeed, the fact that these individuals did not lose much ground relative to nonveterans suggests that there is at least some transferability of general military experience to the civilian job market.

The studies conducted thus far simply have not had the data to address the more relevant concerns of today. Specifically, to what extent does military service help individuals secure a postservice civilian job in their area of interest, especially given the fact that recruits today have considerable say with respect to what military assignment they will have? This and other questions must be addressed in future research.

CONCLUSIONS AND RECOMMENDATIONS

The military operates an enormous training establishment. Literally hundreds of thousands of military personnel receive formal military training each year, and there is probably an equally large, if not larger, amount of informal on-the-job training that also takes place.

Yet, for all the potential importance of military training, surprisingly little is known about, first, the military training system itself; second, the impact of military training on youth employment; or third, the present or potential interaction between military and civilian training approaches and technologies. To be sure, there are scores of studies and articles pertaining to certain narrow aspects of the military training system. But, we were unable to uncover any studies that attempted to survey in a broad sense the issues and topics presented here at the outset. A rich research agenda accordingly awaits those wishing to study these issues.

Before turning to this research agenda, the following discussion first considers these two topics: (1) what is presently known about the impact of military training and (2) what is efficient training from the military's viewpoint as opposed to a broader societal viewpoint?

Impact of Military Training: What is Known

We can envision two primary ways that the military and civilian sectors are likely to interact with respect to training and youth employment. The first, and most direct, is the transfer of skills acquired in the military to civilian employment. The second is the sharing by these two sectors of training concepts, approaches, and technologies.

Theoretically, we would expect there to be a substantial transfer of military-acquired skills to the civilian sector. For example, from the discussion presented in the "Overview," we saw that only about 10 percent of all enlisted personnel are engaged in occupational assignments designated as "combat arms." This means that approximately 90 percent of enlisted personnel are employed in military occupations that are likely to have at least some civilian counterparts. In some cases, the potential for transferability is obvious. Examples include aircraft mechanics, vehicle maintenance, medical and dental technicians, and, of course, air traffic controllers. In other cases, the transferability is less obvious, but nonetheless present.

We can think of the transfer of skills to the civilian sector as occuring in two ways. First is the fact that skills acquired in a particular military job may be applicable to similar civilian employment. Second is the fact that training in a particular military occupation may affect the individual's choice of occupational area in the civilian sector. In other words, individuals' military experience may serve as an important guide to their subsequent career planning and occupational choices. Together, these mean that military training can affect both individuals' selection of a subsequent civilian occupation and their ability to secure employment in that occupation.

Another factor deserving mention concerns the way that the military stands apart from most civilian training institutions. Specifically, the military provides not only formal training as given in civilian institutions, but also on-the-job training, refresher training, and, perhaps most important, actual job experience.

One final aspect deserves mention, and that concerns the "certification" effect of military training and job experience. At one time, satisfactory completion of one's military obligation, even if wholly unrelated to the individual's subsequent job, was viewed as an indicator of moral character, patriotism, and general suitability for employment. Although the need to demonstrate satisfactory military service in less relevant to today's environment, the certification effect is still likely to have a significant effect for so-called disadvantaged groups, especially racial and ethnic minorities. DeTray's (1980) study suggests that in the aggregate, the earnings prospects for blacks are enhanced by military service, thus giving some support for the "certification" hypothesis. In this sense, military service often is seen as a vehicle for entering the mainstream of society.

Unfortunately, our empirical knowledge goes nowhere near as far as we would like with respect to these issues. Beginning with training approaches and technologies, one can find some isolated studies and anecdotes; but we were unable to locate any systematic assessment of the technologies and approaches used in the military versus civilian sector, how and why they differ, how they might be related, or how interaction could be improved to the benefit of both.

Turning to the transferability of military-acquired skills to the civilian sector, we similarly have little information with respect to how military training and experience affect individuals' subsequent occupational choices. To what extent does the military alter individuals' subsequent occupational choices versus to what extent do individuals choose military occupations that conform to their prior preferences? The answer to this is simply not known.

The literature does contain some evidence, however, with respect to how military service affects individuals' subsequent earnings. For example, it was noted in Norrblom's study (1976) that individuals who became employed in jobs in the civilian sector in which they were able to use their military-acquired skills received higher wages relative to those former military personnel who received military skill training unrelated to their civilian jobs. Trost and Warner (1979), in a similar fashion, demonstrated that individuals who received electronics training in the military and subsequently became employed in electronics-related jobs in the civilian sector fared better than those individuals who neither received electronics training nor were employed in a job in which it was required. However, they also found that, relative to other forms of training, military training does not appear to yield any wage premium. Cooper's study (1981b) of military retirees shows that those who found postservice employment in occupations similar to their military occupations fared much better, over the long run, than those retirees employed in occupations dissimilar to their military service.

Nevertheless, for the most part the evidence on the impact of military training is at best sketchy. The primary reason for this is the lack of good data. Even the National Longitudinal Survey (NLS) data base, which has been used so profitably for many other studies, has not been useful for the issues raised here since the first NLS contained little data on individuals' military experience. Fortunately, the ongoing NLS, which is being supported by both the U.S. Department of Labor and the U.S. Department of Defense, will contain much more extensive information on individuals' military experience, including training, and thus should be useful for future studies.

Military vs. Societal Objectives

It must be remembered that, in our view, the primary purpose of the military is to maintain an effective fighting force designed to protect the national interest. This means the military should deter war, and, that failing, it should have the ability to wage and win a war.

This is not to say that the military cannot perform socially useful functions, for it can, such as the role it played in helping to pave the way for racial integration. However, social objectives must, in our view, be subordinate to the primary purpose of providing for the nation's defense.

The reason for this is twofold. First, requiring the military to perform too many social functions may degredate military effectiveness. Second, the military is likely to be an inefficient means for realizing social objectives.

The implications of these points for military training are severalfold. First, restructuring military training solely to enhance the transferability of skills to the civilian sector would be unwise. On the other hand, civilian institution officials ought to learn more about the present system in order to take better advantage of what is already being done. However, although the military should not be viewed as an alternative to social action agencies, such as CETA, there ought to be better integration of social action agencies and the military. For example, the lack of adequate reading skills is a major reason why many disadvantaged youth are disqualified for military service. As a result, civilian programs structured to improve reading skills could be used to funnel successful graduates into the military.

Finally, there appears to be considerable opportunity to enhance the transfer of training concepts, approaches, and technologies between the military and civilian sectors, from the former to the latter and vice versa. To be sure, some of this already takes place, but much of it is by accident, not in a systematic fashion.

Research Agenda

Perhaps the most important point to be established here is the need for further research on the issue of military training and its impact on the youth labor force. The potential impact is substantial; our knowledge is at best limited.

Four main topics in particular deserve attention: (1) the impact of military training and experience on individuals' occupational choice; (2) the impact of military training and experience on individuals' postservice employment and earnings prospects, especially disadvantaged youth; (3) the extent to which the military can/ought to make use of disadvantaged youth; and (4) ways that military and civilian training programs can improve the transfer of training concepts, approaches, and technologies.

A number of specific research projects within this general framework immediately come to mind. To begin with, we would like to see an expanded and more detailed version of the paper that we have just presented, since we feel that this paper has only begun to scratch the surface with respect to the topics covered.

Such a project would have the modest, but important, objective of describing the research that exists. It would begin with a far more detailed description of the military training system than we were able to provide here. This would include a cataloging of all military uses with respect to the following dimensions: (1) occupational area, (2) type of course, (3) length, (4) material covered, (5) instructional approaches, and so forth. The project would then review, in a more detailed fashion than was presented here, what presently is known about the transferability of military-acquired skills and training to the civilian sector. Finally, it would cover the Project 100,000 experience, to include a thorough scouring of the written literature, plus interviews with those individuals knowledgeable about the project.

Although this proposed project might be thought of as a detailed literature review, we also can envision a number of original research projects. With respect to the transferability of military-acquired skills to the civilian world, we believe that it is sensible to pursue the two approaches outlined by Norrblom (1977): (1) examining the utilization of military-acquired skills and (2) examining the subsequent economic effects of military training. In the first case, it would be useful to develop a catalog of the possible links between military service and civilian employment. For example, one might show the comparable civilian occupations for all military training courses and occupational specialties and the extent to which the skills and experience obtained in the military might be useful for each civilian occupation.

To examine the economic effects of military training and experience, the new NLS offers a potentially important source of data. Unlike the previous NLS, which contained little regarding individuals' military experience, the new NLS will contain a substantial amount of such data. Thus, it may be possible to develop and estimate much more detailed models regarding occupational choice and the effects of military and civilian training.

In the area of disadvantaged youth, it would be useful to determine whether any of the Project 100,000 data can be resurrected. Potentially far more interesting and valuable, however, would be an analysis of the experience caused by the recent misnorming of the ASVAB. Care must be taken to develop a data base that will enable researchers to examine how these individuals fared in the military and how military service affected their subsequent postservice employment. Should such a data base be developed, researchers and policymakers alike are likely to be richly rewarded.

Although we do not believe that it is wise to use the military as a social rehabilitation agency with respect to disadvantaged youth, we believe strongly that many such youth could be potentially valuable to the military and that military service could be of possible significant benefit to these individuals. To the extent that these propositions are true, then it makes sense to search for ways to make more disadvantaged youth available to the military. For example, special reading programs might be undertaken by civilian agencies with the express purpose of enlisting successful graduates into the military. Similarly, civilian training institutions might survey the military with respect to the types of skills required by the services, and gear some of their training accordingly.

Finally, it would be useful to survey the evolution of military and civilian training for like courses. How have training concepts, approaches, and technologies evolved over time? What caused them to change? How successful were the changes? Why? What can the military learn from civilian training institutions and vice versa?

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APPENDIX

Individual Training Facilities (Enlisted) at Major Locations by Training Category, FY 1982

A. Recruit Training

		Training Staff E/S[b]	
Facility Location	*Student Work Load*[a]	*Military*	*Civilian*
Army			
Fort Dix, NJ	2,632	801	6
Fort Jackson, SC	6,158	1,313	31
Fort Knox, KY	2,313	574	33
Fort Leonard Wood, MO	2,794	690	20
Fort McClellan, AL	1,392	232	23
Fort Sill, OK	526	73	0
Fort Gordon, GA	745	286	0
Navy			
Great Lakes, IL	5,861	595	1
Orlando, FL	4,809	501	0
San Diego, CA	4,359	437	8
Air Force			
Lackland Air Force Base, TX	10,117	868	18

SOURCE: U.S. Department of Defense 1981a.

[a] The student work load is the average number of students being trained by a given service. This might differ from the training loads discussed elsewhere in this paper because the student work load includes some trainees and students of foreign nations, DoD civilian employees, and members of other U.S. Government departments and agencies.

[b] Reflects manpower end-strength (E/S) to include instructors, school/training center staffs, student supervisors. Excludes training support, Management Headquarters, and Base Operating Support.

B. Specialized Skill Training[b]

Facility Location	*Student Work Load*	*Training Staff E/S*[a]	
		Military	*Civilian*
Army			
Aberdeen Proving Ground, MD	3,281	1,210	238
Charlottesville, VA	161	28	37
Fort Belvoir, VA	1,263	513	92
Fort Benning, GA	4,432	1,172	133
Fort B. Harrison, IN	2,329	473	113
Fort Bliss, TX	1,235	1,356	222
Fort Bragg, NC	533	619	96
Fort Devens, MA	1,022	841	94
Fort Dix, NJ	65	22	23
Fort Eustis, VA	1,900	827	190
Fort Gordon, GA	7,883	2,130	584
Fort Huachuca, AZ	958	483	130
Fort Jackson, SC	3,963	736	52
Fort Knox, KY	2,050	1,165	224
Fort Lee, VA	4,441	1,402	350
Fort L. Wood, MO	1,337	492	20
Fort McClellan, AL	1,337	536	68
Fort Rucker, AL	986	334	79
Fort Sam Houston, TX	5,512	1,414	498
Fort Sill, OK	2,112	1,068	274
Fort Wadsworth, NY	142	71	23
Monterey, CA	3,579	201	596
Redstone Arsenal, AL	1,237	848	276
Rock Island, IL	377	0	80
Savanna Army Depot, IL	135	0	50
Texarkana, TX	178	0	40
Fort Ord, CA	94	46	18
Norfolk, VA	260	72	0

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[a] Reflects manpower end-strength (E/S) to include instructors, school/training center staffs, student supervisors. Excludes training support, Management Headquarters, and Base Operating Support.

[b] Includes enlisted and officer specialized skill training facilities.

Facility Location	Student Work Load	Training Staff E/S[a]	
		Military	Civilian
Navy			
Athens, GA	358	46	14
Bethesda, MD	156	65	9
Charleston, SC	569	469	7
Dam Neck, VA	1,678	1,213	59
Great Lakes, IL	9,201	1,665	20
Great Lakes (Medical)	540	62	9
Groton, CT	2,340	849	10
Groton, CT (Medical)	58	13	2
Gulfport, MS	407	112	11
Idaho Falls, MD	837	536	0
Indian Head, MD	356	87	6
Jacksonville, FL	280	162	0
Lakehurst, NJ	446	177	11
Little Creek, VA	694	141	12
Mayport, FL	248	98	2
Memphis, TN	8,267	1,061	159
Meridian, MS	879	110	8
Monterey, CA	29	8	7
Newport, RI	754	384	16
Norfolk, VA	1,894	953	19
Oakland, CA	49	6	8
Orlando, FL	5,120	520	15
Panama City, FL	110	103	3
Pearl Harbor, HI	472	297	10
Pensacola, FL	2,333	763	45
Pensacola, FL (Medical)	34	82	32
Philadelphia, PA	405	86	4
Port Hueneme, CA	527	148	26
Portsmouth, VA	34	0	1
Portsmouth, VA (Medical)	274	47	2
San Diego, CA	8,614	2,844	158
San Diego, CA (Medical)	1,223	148	12
San Francisco, CA	203	110	21

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[a] Reflects manpower end-strength (E/S) to include instructors, school/training center staffs, student supervisors. Excludes training support, Management Headquarters, and Base Operating Support.

		Training Staff E/S[a]	
Facility Location	Student Work Load	Military	Civilian
Navy (continued)			
Schenectady, NY	617	642	0
Vallejo, CA	957	512	0
Windsor, CT	230	158	0
Whidbey Island, WA	156	114	0
Air Force			
Chanute Air Force Base, IL	4,375	1,230	503
Fairchild Air Force Base, WA	193	318	19
Goodfellow Air Force Base, TX	1,314	444	37
Homestead Air Force Base, FL	45	106	2
Keesler Air Force Base, MS	6,856	1,630	658
Lackland Air Force Base, TX	2,763	853	275
Lowry Air Force Base, CO	4,405	1,666	354
Sheppard Air Force Base, TX	4,630	906	495

C. One-Station Unit Training (OSUT)

		Training Staff E/S[a]	
Facility Location	Student Work Load	Military	Civilian
Army			
Fort Benning, GA	8,660	2,065	30
Fort Bliss, TX	1,447	580	24
Fort Dix, NJ	2,647	710	9
Fort L. Wood, MO	3,964	1,533	75
Fort Sill, OK	4,722	1,229	49
Fort McClellan, AL	2,954	580	25
Fort Knox, KY	2,782	1,334	148

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[a] Reflects manpower end-strength (E/S) to include instructors, school/training center staffs, student supervisors. Excludes training support, Management Headquarters, and Base Operating Support.

ALVIN TUCKER

6

Job Training in the Military—Reactor Comments

The paper by Cooper and Huerta provides an excellent introduction for anyone interested in finding out more about military training. It gives essential statistics as well as an accurate description of the process.

I was particularly interested in the data about the impact of military training on a person's subsequent career and future earnings. There is no doubt the data presented show only a slight advantage in these areas for people with prior military training. Nevertheless, the perception of most people entering or leaving the service is just the opposite of this finding. For instance, surveys of new enlistees show that one of their strongest reasons for joining the service is self-improvement in both educational and occupational skills. Likewise, we find that many people leaving the service expect to take advantage of their military skills to gain a better-paying job in the civilian sector. The value of those military skills is graphically illustrated by the number and frequency of want ads placed by prospective employers in publications that circulate widely within the military community. Just a quick glance at the *Navy Times* confirms that sailors trained in avionics, data processing, electronics, communications, and boiler maintenance have a ready civilian market for their skills. Therefore, I would be very cautious about accepting the conclusions concerning the impact of military training on a person's future job potential. It seems to me that a common perception shared by millions of people over the last three decades is likely to have a solid basis in fact. Nevertheless, I agree with Cooper and Huerta that we need more research in this area.

On the question of job performance by members of the service, our experience shows that the single best predictor of overall military performance is the possession of a high school diploma. People with high school degrees are twice as likely to finish their full tour of duty, as compared to high school dropouts. Graduates have less disciplinary problems and, on the average, get promoted faster to higher military rank. They also are more likely to be eligible for reenlistment.

The second best predictor of performance is the score a person gets on the various parts of the entrance exam given to all potential enlistees for the service. The primary purpose of that exam is to identify an individual's specific aptitudes in a variety of skill areas. These aptitude scores then are used to select the training program best suited both to the needs of the military and to a person's ability. For instance, someone with high scores in the electronics part of the exam would most likely be offered a course of training as an electronics technician, if an opening were available. Our research confirms that the use of test scores for this purpose is a statistically valid way to place people into training programs.

The important point for disadvantaged youth to know is that the military, like all employers, is looking for the best people it can find, and it is being more selective than most people think.

It may come as a surprise, but the services now reject about 35 percent of enlistment applicants for physical, moral, and educational reasons. Therefore, young men and women who are hoping to use military service to better their lot in life, as so many have in the past, can substantially improve their chances for acceptance in the military by staying in school and mastering basic educational skills. In other words, it would be a mistake for them to think a military career is open to them despite their past record in school and in society.

The CETA System of Job Training

GARTH L. MANGUM

7

CETA as a "Second Chance" System for Disadvantaged Youth

INTRODUCTION

Among the publicly supported training programs available in the United States, only those programs funded under the Comprehensive Employment and Training Act (CETA) are explicitly designed to give a second chance at employability development for those already in the labor market and floundering—the disadvantaged workers. Though all of its components served some youth, only the Job Corps, from 1974 to 1977, was explicitly a youth program. Then in 1977 Congress passed the Youth Employment and Demonstration Projects Act (YEDPA) and in 1978 grafted it onto CETA as Titles IV and VIII, thus creating an explicit second chance program for disadvantaged youth. However, the law also requires the prime sponsors who operate the local CETA programs to maintain the same youth proportion of enrollments under Title II-BC, which existed prior to YEDPA, and to enroll some youth in programs operated under other titles.

CETA is many things to many people. It can provide services to those of any age, sex, race, or any other characteristic as long as they are economically disadvantaged. It can also support a wide range of services, generally divisible into the two categories of employment and training. A second chance for disadvantaged youth, however, implies an emphasis on development of the requisites that make one employable rather than the provision of employment itself. Hence, this paper analyzes the extent to which—and the success with which—all of CETA serves as a second chance employability development program for disadvantaged youth. To do so, it combines data available from national sources with the findings of case studies of training programs operated by twelve prime sponsors. As such, it describes and assesses the quality and results of CETA training for all participants and then focuses on those aspects and issues specifically applicable to youth.

ORIGIN AND STATUS OF CETA

CETA's formative background and current status and prospects are necessary background for examining its contributions and potential as a "second chance" program for disadvantaged youth.

Historical Background

CETA emerged in December 1973 as the replacement for and direct descendant of the Manpower Development and Training Act of 1962 (MDTA) and the Economic Opportunity Act of 1964 (EOA). These Acts had resulted from different motivations and then coalesced around a common theme. In MDTA's background there had been the problems of plant closings and skill obsolescence and ambitions for economic development and adaptation to technological change. Its original concern when written in 1961 and passed in 1962 was with the mature worker of long labor force attachment, who was displaced and in need of retraining. An early version of the Act had three years of labor force involvement among its eligibility criteria for program participants, and the compromise bill passed limited youth to 5 percent of enrollments and the stipend that accompanied their training to $20 per week. There was concern that they not be bribed to leave school.

However, 1963 was a very different year than 1962. The first cohort of the baby boom generation turned sixteen, and the dropouts among them began hitting the labor market. The number of teenagers in the labor force that had been remarkably stable jumped 400,000 between 1962 and 1963, beginning the persistent two-decade rise, which doubled the annual average number by 1980. Between 1962 and 1963 the unemployment rate of those sixteen and seventeen years of age rose from 15.1 percent to 17.8 percent and that for older teenagers from 12.7 percent to 14.2 percent.

A Youth Employment Act was introduced to reinstate the popular Civilian Conservation Corps and National Youth Administration of the 1930s. When that Act was bottled up in the House Rules Committee after passing the Senate, the Manpower Development and Training Act was amended to allow 25 percent youth and to add twenty weeks to the authorized training duration for remedial basic education. The federal vocational education legislation was already undergoing the most basic reexamination since 1917. Its authorizations were multiplied fivefold by the Vocational Education Act of 1963 and its thrust shifted from filling the skill needs of the labor market to meeting the employability needs of the noncollege bound. It is significant that the failing youth legislation of 1963 was totally directed toward job creation, whereas that which passed was completely oriented to training.

With the Civil Rights movement intensifying, the race issue was added to unemployment, resulting in the Economic Opportunity Act (EOA) as well as the Civil Rights Act in 1964. The youth component of the war on poverty used among its weapons the two provisions of the 1963 Youth Employment Act, renamed as the Neighborhood Youth Corps and the Job Corps Conservation Centers. In addition, the U.S. Department of Defense, confronted with phasing out surplus military facilities, added the concept of the Job Corps urban centers as residential vocational schools.

The two EOA youth programs were limited to that population, enrolling a total of 5.5 million over the ten years that followed. The Job Corps was never popular, particularly because of its costs, which were initially in the neighborhood of $8,000 per enrollee. In a famous exchange before a congressional committee, a senator complained that it cost more to keep a youth in Job Corps than it did to keep his son at Harvard. The Job Corps director responded that he would be happy to pay the tuition personally of any Job Corps member the senator could arrange to have admitted to that university (Levitan and Mangum 1969, pp. 179-208). Under favorable assumptions, the ratio of benefits to costs was barely on the positive side. Job Corps was the only manpower or antipoverty program that the campaigning Richard Nixon promised to eliminate, a campaign pledge that was abandoned under the protest of major corporations holding Job Corps contracts.

Neighborhood Youth Corps proved quite popular with politicians and program operators because it was easy to enroll large numbers of individuals at low cost in a variety of public service work experience activities. But it never achieved unity in its benefit-cost ratio and was generally considered by friendly reviewers as an "aging vat" income transfer program to keep the streets quiet and help poor youth over a difficult period of life (Levitan and Mangum 1969, p. 203).

The new Vocational Education Act, on the other hand, was criticized only for the failure of local education agencies to follow the congressional mandate to expand services to the disadvantaged, the handicapped, and the postsecondary population (Levitan and Mangum 1969, pp. 156-159). The 1968 Amendments primarily earmarked funds for those purposes. The appropriations never came up to the authorizations, but by 1978, enrollments were four times what they had been in 1963. Yet the handicapped and disadvantaged never came near the enrollment proportions contemplated for them. Thus, vocational education never became a significant "second chance" program for the disadvantaged.

As the 1960s progressed, two issues persistently resounded throughout the manpower and antipoverty programs, including those for youth: (1) employability development versus employment creation and (2) centralization versus decentralization. The first involved a basic debate, never resolved in employment and training programs: Was disadvantagement primarily caused by the behaviors of its victims or the institutional arrangements of society? Was it people change or institutional change that should be the objective? MDTA and the Job Corps stood on one side of the debate and Neighborhood Youth Corps and other employment creation programs on the other.

The second debate seemed more amenable to resolution. The initial programs were designed in Washington and were nationally uniform. There was a growing demand for more local flexibility in program design and administration. The Economic Opportunity Act was amended at the end of 1967 to delegate to local "prime sponsors" the authority to design and operate "community work training programs" to replace all of the antipoverty manpower programs except Job Corps. The only blight on that consensus was, Who were the prime sponsors to be? Congress did not say but left the issue to the U.S. Department of Labor and the Office of Economic Opportunity to resolve. The first opted for the state employment services and the latter for the community action agencies. Never being able to agree, the act of Congress was never implemented.

The twin issues persisted over the next six years. The Democratic Congress conceived and agitated for the concept of public service employment, a concept that was abhorrent to the incoming Nixon administration.

The latter, with its "new federalism," soon became committed to a fairly extreme concept of decentralization and decategorization. The Comprehensive Employment and Training Act of 1973 was the ultimate compromise. Title I (now Title II-ABC) would endow state and local elected officials as prime sponsors with federal funds to design whatever mix of employment and training programs they preferred and to subcontract for service delivery with whatever local institutions that seemed most appropriate. Title II (now Title II-D) allocated funds to areas of high and persistent unemployment, ostensibly for public service employment but with the explicit provision that Title II monies could be used for any Title I purpose. Local decisions in both Titles I and II would be made within the boundaries of federal guidelines, and program operation would be subject to federal oversight. Title III preserved a role for national programs that could not be constrained within state and local boundaries, such as Job Corps and programs for migrant workers and Native American tribes.

Decategorization also meant that, with the exception of Job Corps, there was no national mandate for youth programs. Prime sponsors were to decide within regulatory limits who to serve, what mix of services to provide, and what organizations to use as service deliverers. Except for the average of about twenty thousand enrolled in Job Corps at any time between 1974 and 1977, each individual prime sponsor decided what proportion of available resources to allocate to youth and whether to serve them in separate youth programs or mix them with adults.

It did not mean that youth enrollments fell. MDTA had become, through metamorphosis, and EOA and CETA were from the start, programs for the poor and disadvantaged. No group was more disadvantaged in labor market competition than the new entrants who were primarily youth. Over MDTA's entire history, 38.4 percent of its enrollees were under twenty-two years of age. Since youth remained overrepresented among the unemployed and poor, they were 51.7 percent of Title I and 20.3 percent of each of Title II and Title VI of CETA in 1977. Leaving it to prime sponsors to establish priorities among client groups clearly resulted in a youth-oriented program. However, it was also a youth employment program rather than a youth employability development program, with youthful Title I enrollees primarily enrolled in work-experience activities.

Youth Employment and Demonstration Projects Act (YEDPA)

The Youth Employment and Demonstration Projects Act of 1977 was an interesting emergence on the policy scene. The youth to adult unemployment ratio, which stood at 3:1 in 1961 and had peaked at 5.5:1 in 1969, had fallen back to the 3:1 level by 1975. However, as a result of the first OPEC oil price escalation and other international economic events, the United States had experienced its deepest recession since the 1930s in 1974-75. Overall unemployment had peaked at 9 percent in mid-1975 and that year's average teenage unemployment had been 19.8 percent, dropping off to 19.0 in 1976 and 17.7 for 1977. At the same time, the black to white youth unemployment gap had been widening with the black teenage rate peaking at 38.3 percent, with the metropolitan-poverty teenage rate averaging 43 percent, just as the total number of teenagers reached its maximum as the results of the baby boom gave way to the impact of the birth dearth. Youth unemployment rates were high primarily because all unemployment was high. Congress and the Ford administration responded accordingly in 1975-76. Largely ignoring youth, they added a Title VI countercyclical public service employment program to CETA and a massive extension of unemployment benefits.

Perhaps the new Democratic administration in 1977 felt obligated to take some social initiatives after eight years of Republican rule. President Carter's economic stimulus package multiplied the Title VI Public Service Employment Program by 250 percent. New employment and training programs were inaugurated for Vietnam veterans, and YEDPA passed with a fiscal 1978 budget of nearly $2 billion, a figure that alone doubled the total budget of all manpower and antipoverty programs for all ages at the close of the Johnson Great Society in 1968.

The congressional attitude was also unusual. Rather than prescribe what in its wisdom it considered solutions to the social malady, it confessed inadequate knowledge and dedicated YEDPA to identifying causes and developing solutions. Thus, YEDPA became a "demonstration projects" act with the purpose of "knowledge development."

The content of YEDPA was, of course, a compromise. In keeping with the decentralized and decategorized philosophy of CETA, a Youth Employment and Training Program (YETP) parallel to CETA's Title I gave prime sponsors funds to use with broad discretion as long as the money was spent on youth. But to keep a national handle on local activities, a Youth Incentive Entitlement Program asked for bids from sponsors to test the effectiveness of summer and part-time work guarantees in improving school retention. A Young Adult Conservation Corps along the lines of the 1930 Civil Conservation Corps model was federally operated. Notably, the emphasis, along with that of the adult-oriented stimulus package, was again on employment rather than employability development. The prime sponsors could use YETP monies for training if they chose, but all of the federally mandated components were work experience.

In contrast to the rest of CETA, the knowledge development emphasis left a large proportion of the funds unallocated by formula and within the discretion of the new Office of Youth Programs (OYP), either to award in response to competitive project proposals or to design and fund demonstrations of its choice. However, the responsibility for this vast new budget had been given to a new office without a provision to increase the number of employees available and necessary to administer it, resulting in a frantic search for devices to get demonstrations designed and monies into the hands of demonstrators. One existing, and two newly created for the purpose, private not-for-profit organizations became the vehicles. The Manpower Demonstration Research Corporation, created in 1976 to conduct the jointly financed, federally and privately Supported Work Program, was used both to undertake further research and demonstration and to act as a conduit to fund public and private organizations. In addition, Youthwork Inc. was created to channel funding to education-related demonstrations and Public/Private Ventures, Inc. to fund and oversee demonstration efforts that involved private employers. Other projects remained within the direct responsibility of OYP, though there was never the staff to adequately monitor them.

This knowledge development effort was unique in national social policy history. The range of experimentation was awesome. Over 300 separate and distinct projects were undertaken. All were carefully documented as to process and substance as well as cost and result. Each involved a treatment group and a control group as close to classical experimental guidelines as conditions permitted. Some forty volumes of description and result have been published, which constitutes perhaps one-fourth of the total stock and flow of data. The task of winnowing out that mass of information for operational and policy lessons has only begun and will probably never be fully completed. But the resulting knowledge is much greater because it was explicitly pursued.

By 1980, then, an extensive second chance program for disadvantaged youth was in place under CETA, in part by design, in part as experiment, and in part because such youth were the ones who knocked on CETA's doors around the country. Table 7-1 provides, for perspective's sake, enrollments and expenditures by program and service component, and table 7-2 identifies the youth proportion. A proposed act to turn that potpourri into a coherent youth program died in the changeover of administrations after November of that year, but the issue still remains. Whatever is formally done should be pursued in the full light of the results of what is currently in place.

TRAINING RESULTS

With that history out of the way, it seems a useful approach to summarize what little is known about CETA's results, overall and for youth, and then to seek explanations for those results and make recommendations for improvements in the results for disadvantaged youth.

Good quality training does not guarantee good results in terms of employment and income improvement for its recipients. The status of labor market demand, the access of the recipients to the demand institutions, the consistency between the demand and the training, and the learning ability of the training participants are additional variables that enter into the success rate. All that is available as a measure of CETA's results is one two-year follow-up (in 1977 and 1978) of a sample of 1976 Title I (equivalent to current Title II-BC) enrollees and another of a sample of 1977 Job Corps enrollees. The first, the Continuous Longitudinal Manpower Survey (CLMS), was accomplished by drawing a sample of the Social Security numbers of the 1976 cohort and following their subsequent earnings patterns through interview and Social Security records. A comparison group was synthesized by identifying a group from the Current Population Survey with the same age, sex, race, and previous employment and earnings patterns, then following their Social Security earnings as well. The Job Corps study used direct contact with both ex-Corps members and a control group.

Both studies have serious limitations. The most limiting is the age of the data. Much has changed in CETA since its 1975-76 infancy. One would expect some improvements from experience. Women are a larger proportion of the total now. Training duration is longer. The law requires targeting on a more disadvantaged population under some titles. Job

Corps should have changed less because of its longer history. Given the limited characteristics data carried in the Social Security data, the closeness of match between a treatment and a comparison group is always in doubt. The 1977-78 follow-up data is the first available, and the current analysis has not had the advantage of previous runs to surface data limitations and analytical oversight. The Job Corps is much less vulnerable to those problems. But with all of the limitations, these data are the "only game in town." Those who must make current judgments about CETA are better off using these data with care and reservation than relying solely on visceral feelings. Fortunately for the reassurance of the analyst, the findings of these two studies are remarkably consistent with pre-CETA analytical results, suggesting both that the findings are dependable and that not much has changed.* The results of these two studies follow.†

The average 1977 Job Corps member averaged $1,000 more per year in wages and fringe benefits than a matched control group during the first two years after Job Corps participation (Mallar et al. 1980). A total of $2,260 was saved from criminal activities that would otherwise have occurred, along with savings from alternative employment and transfer programs. Offsetting those gains was $6,706 per enrollee in program costs, along with the budgeted costs of $6,706 per earnings foregone as a result of participation. Using the studies' assumptions about future work life, durability of the earnings differential, inflation, erosion, and the discount rate, each dollar spent in Job Corps in that year returned $1.39 in social benefits.

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*Summaries of these results can be found in Garth Mangum and John Walsh, *A Decade of Manpower Development and Training* (Salt Lake City: Olympus Publishing Company, 1973); Charles R. Perry et al., *The Impact of Government Manpower Programs* (Philadelphia: Industrial Research Unit, Wharton School, University of Pennsylvania, 1975); The Urban Institute, *Benefits and Costs of Manpower Training Programs: A Synthesis of Previous Studies with Reservations and Recommendations* (Washington, DC, The Urban Institute, 1971); and Michael Borus, "Assessing the Impact of Training Programs" in *Employing the Unemployed*, ed. Eli Ginzberg (New York: Basic Books, 1980).

†The calculations quoted in this section were performed from U.S. Department of Labor data by Robert Taggart and are being published by the W. E. Upjohn Institute for Employment Research in *Toward CETA Redesign: What Has Worked and What Are the Implications*, proceedings of a June 25-26, 1981 conference sponsored by the National Council for Employment Policy. Unless otherwise cited, the quantitative results of CETA participation included in this section are drawn from that source with permission of the author.

TABLE 7-1

	Title II-BC	*Supplemental vocational education*	*Title IV excluding Job Corps*	*Job Corps*
Participants:				
Classroom training	493,683	—[b]	109,556	—
Occupational skills	(352,342)	—[b]	(41,044)	—
Other	(141,341)	—[b]	(68,512)	—
OJT	132,237	—[b]	11,775	—
Job Corps	—	—[b]	—	96,000
Total primary training activities	625,920	—[b]	121,331	96,000
Transition services	695	—[b]	115,094	—
PSE in training	1,209	—[b]	4,945	—
Supplementary training	1,904	—[b]	120,039	—
Person Years of Training:				
Classroom training	164,866	—[b]	24,558	—
Occupational	(128,665)	—[b]	(12,048)	—
Remedial	(36,201)	—[b]	(12,510)	—
OJT	40,042	—[b]	2,416	—
Job Corps	—	—[b]	—	35,700
Total primary training activities	204,908	—[b]	26,974	35,700
Transition services	—	—[b]	41,272	—
PSE training	302	—[b]	—	—
Supplementary training	302	—[b]	41,272	—
Expenditures specifically for vocational and remedial training materials and instruction ($000s)	329,559	76,276	91,141	59,300
Expenditures by program component[a] ($000s)				
Classroom training	696,041	77,601	100,830	—
OJT	145,345	1,832	8,659	—
Job Corps	—	—	—	471,000
Total primary training activities	841,386	79,433	109,489	471,000
PSE training	6,836	—	95	—
Vocational exploration	417	—	9,630	—
Transition services	8	—	31,128	—
Total all supplementary training activities	7,261	—	40,853	—

SOURCE: This material is drawn from unpublished reports put out by the Employment and Training Administration, U.S. Department of Labor, Management Information System Fiscal 1980 Summary Reports and Job Corps Financial Reports, Fiscal 1980.

[a] Does not include prime sponsor administrative costs or U.S. Department of Labor administrative costs in case of Job Corps.

[b] Participants counted in prime sponsor tallies.

Fiscal 1980 CETA Training Activity

PSIP	*STIP*	*Title III*	*Title II-D*	*Title VI*	*Total*
40,734	11,634	17,258	19,298	5,101	697,264
(29,358)	(11,143)	(11,728)	(12,139)	(3,738)	(461,492)
(11,376)	(491)	(5,530)	(7,159)	(1,363)	(235,772)
16,571	1,303	16,273	2,253	834	181,246
—	—	—	—	—	96,000
57,305	12,937	33,531	21,551	5,935	974,510
147	—	—	306	—	116,242
—	—	42	142,252	108,290	256,738
147	–	42	142,558	108,290	372,980
15,112	5,725	3,044	5,080	1,483	219,868
(6,990)	(5,394)	(1,969)	(3,722)	(1,187)	(159,975)
(8,122)	(331)	(1,075)	(1,358)	(296)	(59,893)
3,857	638	6,437	646	263	54,299
—	—	—	—	—	35,700
18,969	6,363	9,481	5,726	1,746	309,867
—	—	—	—	—	41,272
—	—	—	44,444	37,747	82,493
—	—	—	44,444	37,747	123,765
51,861	20,391	17,468	117,269	53,159	816,424
60,205	42,499	7,171	20,940	9,194	1,014,481
18,458	1,692	18,354	2,691	1,922	198,953
—	—	—	—	—	471,000
78,663	44,191	25,525	23,631	11,116	1,684,434
122	—	68	138,907	90,426	236,454
168	—	—	181	8,572	18,968
134	2	—	—	—	31,272
424	2	68	139,088	98,998	286,694

TABLE 7-2

CETA Youth Participation by Title and Program, 1979

Title/ Program	Total enrollment	*Percentage under Twenty-two*					
		Total	*Female*	*Black*	*Hispanic*	*Economically Disadvantaged*	*Dropout*
II-B	603,999	46.9	52.5	38.2	9.4	NA	NA
II-C	5,767	31.2	57.2	39.7	8.2	NA	NA
II-D	152,004	26.4	50.8	38.9	8.0	NA	NA
IV	908,582	98.8	49.6	48.6	12.5	95.8	NA
YCCIP	37,792	100.0	29.0	35.6	8.7	86.8	61.1
YETP	175,946	99.6	56.1	37.3	13.3	79.4	21.4
SYEP	695,650	98.5	49.1	52.1	12.4	98.6	5.0
Job Corps (approx.)	54,200	100.0	30.0	70.0		100.0	85.0
VI	242,596	23.8	43.6	36.4	6.8	NA	NA

Total youth enrollments — 1,409,358 (includes Youth Incentive Entitlement and Young Adult Conservation Corps).

SOURCE: *Employment and Training Report of the President.* 1980.

Using essentially the same assumptions, classroom training merits a social benefit-cost ratio of 1:1.14. The difference between its ratio and that of the Job Corps is primarily the lack of substantial crime-cost savings because of its less crime-prone participant population. The gain side of the classroom training equation consists of an earnings increment over controls for 1976 enrollees of $347 in 1977, and $442 in 1978. On the cost side was $1,397 per participant of which $619 went for allowances, plus foregone earnings.

The classroom training benefit-cost ratios may have improved since 1976 because female participation rose from 50 percent to 57 percent between 1976 and 1980; the CLMS earnings gain differential for females was 2.5 times that for males. Also, the duration of training rose over the same period from 4.3 months to 5.1 months. That would raise costs somewhat, but the 1977-78 earnings show a positive correlation between training duration and earnings greater than the increase in costs. The income gains relative to controls were nearly four times as great for those staying twenty-one to forty weeks as they were for those staying in training eleven to twenty weeks, and more than six times as great for those remaining in training over forty weeks. All of the gains were attributable to increases in employment stability rather than to higher postprogram wages, a condition true of Job Corps as well.

On-the-Job Training (OJT)

For on-the-job training, the major analytical issue is what value to attribute to the trainees' output. The program is designed to subsidize the employer to the extent of one-half the enrollee's wages under the assumption that the trainee's low productivity along with the time of supervisors, materials wastage, and other costs are equal to at least that amount. It can be reasonably assumed that few employers would become involved in OJT unless these costs were covered. Hence, the enrollee's output can be assumed to be worth at least one-half the wage and, given the average preenrollment employment experience and other favorable enrollee characteristics, may be even higher. The value of that output is a benefit of the program if the production would not have otherwise occurred. If the OJT participant was hired in lieu of someone else who would otherwise have been hired but now remains unemployed, there is no production benefit—but there are too many uncertainties to do more than flag that problem.

The average cost per OJT participant for fiscal 1976 was $1,556, of which $428 was administrative costs and the rest was paid to the employer. The average participant received $2,565 per year in wages and fringes, which in 1977 was $839 and in 1978 $574 more than was received by a comparison group. These limited data suggest a deterioration of the earnings differential over time for OJT, whereas the differential appears to increase over time for classroom training. More years of observation are needed to be certain of this effect.

Therefore, from a social perspective, the benefit–cost ratio would be 2.18 if the trainees' production was worth one-half the wages received and 3.72 if worth three-quarters of the wage.

Public Service Employment (PSE)

If public service employment is viewed strictly as a job creation program, the only relevant measure of accomplishment is the net increase in employment that resulted. The issue involved is one of displacement. That is, did state and local governments, anticipating that the availability of PSE would allow them to produce public services at federal expense, reduce the expenditures that they might have otherwise made and, therefore, the public employment they might have created? The most careful study of this displacement effect put it at 18 percent of the CETA public service employment (Nathan 1978 and 1979).

However, Title II-D contained language identifying transition into unsubsidized employment as one of its objectives. The extent to which PSE involvement contributes to a more favorable employment experience thereafter can be tested by comparison with the experience of control groups.

The 1977 Social Security covered earnings of those participating in PSE in 1976 were $261 higher and their 1978 Social Security earnings $326 higher than the earnings of a matched comparison group. These sums amounted to 31 percent and 26 percent gains, respectively, over their controls. Moreover, many public employees are not covered by Social Security, which creates a persistent underestimate of public sector earnings. Since most of the postenrollment of PSE enrollees is in unsubsidized public sector jobs, the real differential in their favor may be even higher.

If the work performed by PSE participants can be assumed to be equal in value to the wages received, and if the federal expenditures are not offset by a reduction in state and local government expenditures, there can be no doubt of a highly positive benefit-cost ratio. Neither can be proven, however. It is difficult to measure the output of many public sector jobs. Until 1978, PSE participants were given work assignments not unlike those of regular public employees and their output should have been approximately equal. After 1978 a focus on the more disadvantaged was imposed along with the increased assignment of PSE enrollees in work crew settings, not unlike work experience programs, thus placing their productivity in doubt. Finally, since the earnings gains emerged primarily from transition to unsubsidized public posts, those distrustful of public sector employment may consider those increases to be drains rather than gains. On the whole, however, pre-1978 PSE seems to have functioned as a profitable public sector OJT program.

Work Experience

Work experience programs from the days of the Neighborhood Youth Corps to the present have been characterized as "aging vats" and as income transfer programs, not justifiable as a means of improving employability. The CLMS data differ significantly from that traditional appraisal. Youth nineteen to twenty-one years of age and adults between twenty-two and forty-four participating in work-experience programs in 1976 actually earned less on the average than comparison groups in 1977 and 1978 (table 7-3). But the seventeen- and eighteen-year-olds, those over forty-five years of age, and minority females had earnings gains significantly above those of their controls. The well-known Supported Work Program had disappointing results for youth in general, failing to raise their earnings or lower the crime incidence below that of comparison groups, despite the fact that the program worked well for some other groups (Manpower Demonstration Research Corporation 1980). Thus, the record is mixed for youth work experience. Apparently, it has been effective for the very young with no previous work experience but not for older youth who appear to learn more bad habits than good.

However, it need not be so. Some prime sponsors report under the rubric of work experience an enriched program of employability development even beyond the best of training programs (Pines and Morlock 1978). Periods of remedial education, career exploration, and occupational training are interspersed with periods of work experience structured as opportunities to try out in practice what has been learned in the classroom before returning to the latter for further instruction. The Ventures in Community Improvement (VICI) demonstration project in nine sites was designed to provide intensive vocational skills training in the work place and to use the publicly subsidized work experience under journeymen instructors as a transition route into the private construction industry. The participants did not experience higher employment rates after completion than their comparison groups, but those employed did find their way into substantially better-paying jobs.

But earnings are not the only objective for youth. Certain youth work programs have had a significant effect on such outcomes as school retention and criminal activity as discussed in the following section.

Nonoccupational Training

More than a third of CETA classroom trainees participate in various remedial activities other than occupational skill training and work experience. Occupational training usually is also supplemented to some degree by basic academic training, job search assistance, and transition services. These are less often available to PSE and work experience participants. In Job Corps, expenditures for remedial education, counseling, world-of-work training, and health instruction exceed the costs of vocational training.

These other activities have several basic missions: first, they seek to improve reading and writing skills and to provide academic credentials; second, they seek to alter attitudes and behavior in order to motivate participants and help them adjust to the mores of the labor market; third, they aim to aid occupational choice and job-seeking skills so that labor market performance will be improved. Attitudinal change, basic skills gains, and employability skill improvements are difficult to assess and because such components are usually short-duration or supplementary activities, the impacts are not large enough to be easily measured. Further, the changes that are produced may or may not be manifested in significant employment and earnings improvements. For these reasons, these "other" remedial activities have largely remained the invisible ingredients in the CETA stew. Though one cannot find definitive measures of those effects, there are certainly some indicative ones.

Job search training. Job search training is a rapidly growing concomitant for CETA used sometimes as an add-on to a classroom occupational program, sometimes as a transition aid out of PSE, and sometimes as a separate program given to enrollees receiving no other services. Placements from job search training range from 35 percent to over 90 percent, skewed heavily to the upper side at costs that range from $150 to $600 per enrollee. The only controlled evaluation available, however, is for youth demonstrations. The youth search training demonstrations provided short (two days to four weeks) involvements coupling formal instruction in job search techniques with experience and supervision in looking for work, as opposed to long-term career development, occupational guidance, and vocational exploration efforts. In the larger of these demonstrations, 178 youth and a control group selected through random assignment were provided an average of eighty-three hours of activities, the primary component of which was applying for jobs under careful supervision after instruction in resumé writing, how to contact employers, interviewing, employer expectations, and personal job-related counseling. There is evidence of substantial short-term effects on job finding, as the following figures demonstrate:

	Percentage finding jobs	
Weeks after termination	*Experimentals*	*Controls*
10.5 weeks posttermination	63.6	47.7
26.5 weeks posttermination	77.1	73.2
27.5 weeks posttermination	79.3	78.0
45.4 weeks posttermination	79.2	81.8

An even shorter duration intervention was tested that provided two days of nonstipended job search assistance to very disadvantaged youth for whom the state employment service could find no referrals, matched to a control group of nonparticipants. At the six-week follow-up point, 45 percent of the experimentals compared to 32 percent of the controls had found jobs. After three months, the figures were 65 percent and 51 percent, respectively. Since the treatment group members were shown by past performance to have a substantially lesser probability of finding a job than the controls, controlling for that effect showed that the probabilities of success for the treatment group had increased 18 percent at six weeks and 17 percent at twelve weeks.

Finally, a study of job-search assistance programs under the Work Incentive Program (WIN) found that among persons under age twenty-one who participated, the employment rate after leaving the program was 48 percent compared to 25 percent among youth enrolled in routine WIN services.

Remedial education. Remedial basic education is a widespread accompaniment to CETA training and to Job Corps enrollments. Among all persons fourteen to twenty-one who participated in CETA programs in 1978, 19 percent reported receipt of basic education services; 2.3 percent, English language training; and 12.6 percent, GED training. For participants in year-round programs other than inschool activities, the proportions were 31.9, 3.4, and 22.9 percent, respectively. Among high school dropouts participating in CETA, one-third reported receiving basic education and one-third reported receiving GED training (the same individual may receive both). All participants in Job Corps, except about 5 percent who had a high school diploma and tested as having adequate competencies, participated in remedial basic education. Usually, education components are a half-day or the equivalent of twenty hours weekly.

One of the demonstration projects initiated under YEDPA was a test of various education approaches under random assignment conditions in Job Corps centers. The Job Corps members were tested at point of assignment to educational programs and then randomly placed in an experimental component or a traditional Job Corps educational program. They were then tested after 90 and 150 hours of instruction, or after approximately ten and thirty weeks of participation. The large, multisite control groups samples provide an indication of the overall effectiveness of Job Corps education. After over ninety hours of treatment, there was a gain of 1.5 years in achievement in reading according to the SAT test, and 1.0 year in achievement in math. For the 1972-74 period when gains tests were a regular part of Job Corps, the monthly gain rates averaged 2.0 and 2.3 months of reading and math achievement, respectively. The more current data translate into gain rates of 3.3 and 2.2, respectively.

For more general results from remedial basic education, going back to MDTA, seventy-three hours of instruction were found to be necessary to raise reading performance by one grade level, whereas eighty-two hours of instruction did so for mathematics. Adult basic education efforts under CETA frequently show reading gains from 1.5 to 2 years from twelve weeks of instruction, though there are also indications of rapid erosion of these gains over time. Two studies found earnings gains for males of about $300 during the first year for participation in ABE (Brazziel 1966; Roomkin 1973).

Alternative education. The Career Intern Program (CIP) also produced evidence that alternative education approaches can be effective for the dropout-prone youth. CIP is an intensive alternative education program for dropouts or dropout-prone youth that has high teacher–pupil ratios, individualized, self-paced, and experience-based instruction, linkages with the world-of-work, and an emphasis on student decision making, initial support, and motivation. This approach was initially tested in Philadelphia and then replicated in four sites at a cost approximately double that of a normal high school. After over half a year of CIP treatment, the youth in the alternative schools moved from the 36.6 percentile in the distribution of the metropolitan achievement test to the 40.1 percentile, whereas the control groups advanced from 36.6 to 38.0. In mathematics, the increase for the treatment group was from 26.2 to 30.1 compared to an increase from 28.6 to 29.2 for control groups. In both cases, the gains of the experimentals were statistically significant; i.e., they improved their relative status. At the same time, these youth increased their high school completion probability by 50 percent more than a control group and their likelihood of employment by a similar amount.

In other words, the evidence from CIP and Job Corps suggest that disadvantaged youth can be taught and can learn faster in these unconventional settings than in more traditional school settings, even when (or perhaps because) remedial education is mixed with work experience, vocational preparation, basic life skills training, and character development activities.

Although this suggests that alternative programs have the ability to advance tested reading and math competencies substantially, only a small number of those with educational deficiencies can be brought up to the level where they can be credentialed with a GED certificate. As an example, because Job Corps members have an average tested reading level of 5.6 grades, only a few can immediately enter or catch up to the level where they can pursue a GED. It is estimated that roughly one-sixteenth of Job Corps entrants are eligible for GED on entry, i.e., having a tested achievement level roughly at the eighth grade level of reading. Two-thirds of these participate in a GED program and 65 percent of them complete the GED program. Nine out of ten who complete the program and take the state GED test pass it. In other words, Job Corps increases the chances of having a GED or high school diploma from 10 to 15 percent. Moreover, 40 percent of all enrollees who stay more than ninety days complete a GED.

In local CETA programs, which serve a less disadvantaged youth population and thus more individuals closer to the margin, the record of success is roughly the same as for Job Corps. Under the Youth Employment and Training Program and Youth Community Conservation and Improvement Projects, where a record is kept of GED receipt, the number of participants who receive a GED certificate represented 7.8 percent of all dropouts who participated in fiscal 1980.

The GED certificate appears to pay off in the labor market for Job Corps members. Adjusting for race, age, occupational training cluster, and entry education status, males who completed a GED had a .68 chance of employment compared to .63 for others. Their earnings average $118 weekly versus $104 for those who did not complete the GED. However, females did not gain in employment or income in relaton to controls as a result of achieving a GED.

English as a second language. Another rapidly growing nonoccupational skill component is English as a second language (ESL). A flood of immigrants and refugees in border and coastal states has produced a CETA-eligible population with strong motivation and, often, substantial work experience that needs to be supplied mainly with communication skills. The costs are low and the success rates experienced by prime sponsors in areas heavily impacted by immigration are high. However, no national source of ESL outcomes data exists.

Attitudinal Change

During 1975-77 a sample of Job Corps participants and a control group of applicants who did not participate were interviewed at an entry point and an average of eighteen months later, using a battery of questions scaled to address twenty-two different dimensions of job-related, noneconomic impacts—including industry of occupation; on-the-job behavior; job interest; understanding of the value of work; attitudes toward self, peers, family, and authority figures; as well as health impacts. The evidence suggests that, for those who stayed more than ninety days in Job Corps, the impacts relative to controls were concentrated in the social-attitudinal area: self-esteem increased, particularly for females, family relations improved both for males and females, use of leisure time improved for males and somewhat for females, and attitudes toward authority improved, whereas police involvement and the incidence of out-of-wedlock children declined. In the two-year follow-up quarter, the former Job Corps members spent 4.4 percent of their time in college or vocational or technical school, compared to .7 percent of the control group. By the twelfth to eighteenth month after termination, cumulative moves across cities for job opportunities are 44.7 moves per every hundred Corps members (excluding Job Corps relocations), which is double the rate for controls. This may indicate increased maturation and self-reliance from participating in the residential program.

The evidence of in-program and postprogram attitudinal change for Job Corps participants can be contrasted with the findings of the Supported Work Program for youth. Supported Work provided local, full-time employment for up to eighteen months in a structured setting providing graduated responsibilities, extensive supervision, and peer group interaction (Manpower Demonstration Research Corporation 1980). The youth cohort in Supported Work consisted of dropouts who were very much like the Job Corps enrollees. During the period of participation there was evidence of a decline in "hard" drug usage relative to controls but an increase in marijuana and alcohol usage. In the postprogram period, the participants were about equal with the control group in alcohol and marijuana use but were more likely to use other drugs. The average number of arrests was slightly higher for participants than for controls both during and after enrollment. The postprogram employment effects of Supported Work for youth were minimal, with evidence of a slight increase in the hours of employment but with earnings deficiencies relative to controls.

A test of the effects of inschool guidance, counseling, maturation, and employability skills development effects was provided by the Youth Career Development (YCD) Program that offered five to ten hours a week of instruction and activities for students during or after the school day. The projects were operated in twenty-six sites by a variety of delivery agents under standardized ground rules. In each site, control groups were drawn from like individuals and the results of interviews and tests further matched by regression analysis. The participants were given a battery of tests at entry and exit (one school year) that included subsets of questions designed to measure changes in vocational attitudes, work-relevant attitudes, six-stereotyped attitudes, and self-esteem, plus job knowledge, jobholding skills, and job-seeking skills. The participants gained significantly relative to control group members in all areas except job knowledge (where their gains fell just short of statistical significance), and self-esteem (where there was little change for participants or controls). Three months after the end of the school year, the participants had made small employment gains related to controls, with a larger relative gain evident after eight months.

It also appears that different dimensions of change are related to different postprogram outcomes. As an example, the Jobs for Delaware Graduates (JDG) Program was a variant of YCD. It used a specially created, business-oriented but broad-based intermediary to provide transition services in school that were very similar in hours of activity to those of YCD. However, JDG focused specifically on students who wanted to go immediately into the full-time labor market after graduation. The aim of JDG was not to develop personal character, as in most of the YCD projects, but to provide what was needed to get a job. The YCD produced statistically significant gains for experimentals relative to controls on five of the seven psychometric scales (self-esteem, sex stereotyping, work attitudes, job knowledge, and vocational attitudes) compared to statistically significant gains on only two of the seven measures for JDG participants. Of critical importance, however, JDG participants gained most on job-seeking skills and job-holding skills, i.e., where the program placed its greatest emphasis.

There was an enormous difference in three-month follow-up results—particularly in the percentage of participants working fulltime and in the differential between experimentals and controls. In JDG, 55 percent of participants were working three months after graduation, compared to 25 percent of those in YCD. The proportion working fulltime for experimentals was seventeen percentage points higher than for controls in JDG, whereas it was only two percentage points higher in YDC. On the other hand, JDG youth were less likely to be in school or training subsequently.

School-work transition. These attitudinal changes were the products of programs for which the primary objective was successful school-to-work transition. The gains in employability skills and school retention documented for those in school transition projects might be contrasted with the tested outcomes for participants relative to control group participants in Summer Youth Employment Programs (SYEP), which represent, on average, 230 hours or approximately one-half the hours in YCD. For regular summer programs, which emphasize work experience followed by a week of "enrichment," there are no gains relative to control groups on any of the employment and earnings measures. In multisite demonstration projects using work and enrichment essentially half and half, as well as in fulltime vocational exploration activities, there was no evidence of statistically significant employment gains along these dimensions relative to controls, but there was evidence that these interventions reduce in-program but not postprogram arrest rates. However, SYEP modestly increased the chances of returning to school and of working while in school. For a national sample of SYEP participants, 96 percent of the treatment group and 91 percent of the controls returned to school. For the demonstration groups, the comparison was 73 to 68 percent. Three months after the end of the summer 1979 program, 24.6 percent of the sample of participants had or were working compared to 19.0 percent of the control group.

The Youth Employment Incentive Entitlement Program set out to test the effectiveness of a guaranteed summer-time and part-time job on the willingness of a dropout-prone youth population to return to school. Eighty percent of the treatment group did so compared to 70 percent of the controls. The greatest effect was on sixteen- and seventeen-year-old black males and seventeen-year-old black females who were in their junior year and fed up with school. Employment does appear to have holding power for the schools.

Who Gains?

Table 7-3 provides summary enrollments, costs, and results for those components that are (1) uniformly reported, and (2) have identifiable employment and earnings impacts. They indicate a preferred status for those components that have potential for increasing employability as contrasted to those providing primarily job creation.

The gains vary widely among participant groups as shown by tables 7-4 and 7-5. Table 7-4 shows the gains of enrollees related to comparison groups, and table 7-5 shows the gains of enrollees in relation to their own preenrollment earnings. Classroom training appears to be the preferable route for adult women with high previous earnings. OJT appears to serve best the males and minority females, the very young, the middle-aged, and the previously low wage earners. Very young females appeared to be the winning profile for public service employment, especially if they had low previous earnings. Women, young teenagers, and older workers were the major gainers from work experience.

For youth, the data would suggest an emphasis on on-the-job training and public service employment, with classroom training and work experience not to be rejected for the very young. Public service employment probably serves as OJT in the public sector, whereas any experience is

TABLE 7-3

Enrollments and Outcomes of CETA Components

Component	*FY 1980 enrollments*	*Program Costs*		*Average duration of stay (months)*	*1976-78 social benefit-cost ratio*
		Per participant	*Per year*		
Classroom training	750,000	$2,481	$8,046	5.1	$1.14
On-the-job training	181,000	1,638	6,088	4.3	2.18
Public service employment	870,000	3,702	9,030	11.3	NA
Work experience	400,000	1,641	5,311	4.9	negative
Job Corps	95,000	6,706	13,193	6.2	1.39
Summer youth employment	705,000	743	NA	NA	NA
Other youth programs	330,000	NA	NA	NA	NA

SOURCE: Taggart, forthcoming.

TABLE 7-4

Earnings Differentials over Controls for Various Enrollee Characteristics and Programs

Enrollee characteristic	*Program*			*Work experience*
	Classroom	*OJT*	*PSE*	
White male	$495	$615	$ 429	$-471
Minority male	73	440	-562	-197
White female	784	515	1,192	- 34
Minority female	747	747	1,098	442
Age:				
17-18	204	776	966	249
19-21	94	526	483	-621
22-25	287	400	187	-121
26-29	427	359	723	-716
30-44	1,280	803	113	-436
45 and over	481	640	732	563
Previous annual earnings:				
Under $2,000	457	797	834	-195
$2,000-$4,000	305	355	331	-228
Over $4,000	982	362	153	-228
Average all groups	468	565		

SOURCE: Taggart, forthcoming.

TABLE 7-5

Employment and Earnings Changes From Year Before Entry to Second Post-Termination Year for Subgroups of Participants in Different Activities (Second Half Fiscal 1975 Entrants)

	Change in Percentage of Time Employed				*Change in Annual Earnings*			
	Classroom Trainees	*On-The-Job Trainees*	*Work Experience Participants*	*Public Service Employment Participants*	*Classroom Trainees*	*On-The-Job Trainees*	*Work Experience Participants*	*Public Service Employment Participants*
Male	20%	23%	15%	24%	$2710	$3150	$1800	$2980
Female	23	32	21	22	2200	3260	1970	2250
White	22	25	14	25	2690	3270	1700	2950
Black	21	25	25	17	2080	3060	2020	2060
Other	22	31	23	26	2530	2990	2420	2910
Less than age 22	24	26	—	27	2520	3340	—	2770
22 +	20	26	17	22	2380	3120	1980	2730
Less than 12 years education	20	21	22	12	2180	2400	1610	1380
12 years or more	23	28	15	27	2590	3550	1980	3200

SOURCE: Westat, Inc., 1980, tables 58 and 60.

better than none for those who have never had any. However, as table 7-6 indicates, few youth under eighteen years of age find their way into any of CETA's training activities. After eighteen, their enrollment is substantial in both classroom and OJT components. Results would suggest a general shift from classroom training to on-the-job training and public service employment for young adults, but neither private nor public employers seem anxious to undertake the task to employ and train the inexperienced. Since the limited returns to investment in the training of the young seem to emerge from their lack of readiness to settle down to either training or employment, selectivity, which enrolled in training only the more vocationally mature, might raise the rate of return substantially. Job Corps manifested a built-in selectivity in its high dropout rate with its favorable benefit-cost record emerging totally from those who stay the full course.

Length of Enrollment

Classroom training under CETA is apparently designed to be of short duration. Among 1977 classroom trainees who considered themselves to be "completers," a third stayed less than the ninety days, only one-third stayed more than half a year, and only one in twenty stayed more than a year. The average was 5.3 months. The period of on-the-job training is even shorter. Only a fifth of OJT enrollees stayed more than half a year, and less than 2 percent over a year, whereas 36 percent stayed less than ninety days for an average of 4.3 months. However, enough became permanent employees to give the program a high payoff.

Local classroom training averages between 22 and 26 hours per week. A typical completer with 22.2 weeks of participation will thus receive, on average, between 500 and 600 hours of treatment (compared to the Job Corps completer who will receive in excess of 2,000 hours, not counting recreation and center life activities). Yet earnings gains are clearly correlated with the duration of training. For the 1976 classroom enrollees, those participating less than 10 weeks gained only $83 over their controls in 1978 compared to a $224 gain for those enrolled 11 to 20 weeks, $832 for those staying 21 to 40 weeks, and $1,377 for the few enrolled for 40 weeks or more. Many of these occupations are not consistent with the length of training time customarily assumed to be necessary for even a nondisadvantaged person to master the required skills as shown by the specific vocational preparation codes of the *Dictionary of Occupational Titles.*

TABLE 7-6

Proportional Enrollments by Characteristics, 1976-80

	Classroom Training				
	1976	*1977*	*1978*	*1979*	*1980*
Male	50	48	44	40	43
Female	50	52	58	40	37
Age at entry:					
less than 18	4	4	5	4	4
18-21	32	34	35	33	31
22-29	39	37	36	38	39
30-44	19	19	19	21	21
45-54	5	4	4	4	4
55+	1	2	1	1	2
White	44	42	50	48	45
Black	36	32	31	34	34
Hispanic	14	12	12	13	11
Other	6	7	6	5	6
Veteran	16	14	11	11	9
Receiving cash welfare or below poverty	68	72	74	80	99
Family receiving benefits	35	35	35	38	
No earnings	42	39	37	38	
Less than high school:					
In-school	5	5	5	4	4
Out-of-school	36	35	34	34	37
High school or more:					
In-school	8	8	9	8	59
Out-of-school	51	52	53	54	
Predominantly employed	11	9	10	9	—
Predominantly unemployed	38	37	31	30	—
Substantially unemployed	13	15	16	15	—
Not in labor force	28	28	30	33	—
Combination	10	12	13	13	—
Average percent time:					
Employed	32	33	35	33	—
Unemployed	38	38	34	32	—
School training	14	11	12	12	—
Out of labor force	17	18	19	22	—
Estimated median family income	4,470	4,700	5,260	4,950	—
Estimated median earnings	550	747	980	1,030	—

(continued)

TABLE 7-6, continued

	On-the-Job Training				
	1976	*1977*	*1978*	*1979*	*1980*
Male	66	68	64	63	63
Female	34	32	36	37	37
Age at entry:					
Less than 18	3	4	3	3	3
18-21	32	31	33	32	31
22-29	39	40	38	39	40
30-44	20	18	20	21	21
45-54	5	5	4	4	4
55+	2	2	2	2	2
White	63	67	68	62	60
Black	20	20	19	23	26
Hispanic	12	11	10	12	11
Other	5	3	4	4	3
Veteran	24	27	31	18	15
Receiving cash welfare or below poverty	51	62	62	73	98
Family receiving benefits	19	18	18	23	—
No earnings	25	24	23	25	—
Less than high school:					
In-school	3	4	2	2	2
Out-of-school	27	26	29	30	33
High school or more:					
In-school	7	9	8	7	65
Out-of-school	62	61	61	61	
Predominantly employed	17	17	17	14	—
Predominantly unemployed	30	29	24	29	—
Substantially unemployed	14	16	16	16	—
Not in labor force	25	24	25	26	—
Combination	14	13	18	16	—
Average percent time:					
Employed	42	46	49	42	—
Unemployed	32	32	28	31	—
School training	13	12	10	13	—
Out of labor force	12	10	13	14	—
Estimated median family income	5,750	5,580	6,630	5,990	—
Estimated median earnings	1,690	1,940	2,430	2,240	—

SOURCE: Internal data obtained from the Employment and Training Administration.

Asymmetry in Choice

If all the major components work moderately well except work experience, how does one explain the persistence of its use by prime sponsors? If longer duration training pays off better than those of short duration, how does one explain the average of 26 weeks and the general limitation to one academic year when 104 weeks are allowed? The answers to those two questions may lie in a myopia inherent in the current data system. The fact is that neither the federal nor the local officials had any way until now of knowing the long-term results of their efforts.

Prime sponsors do not indulge in long-term follow-up and controlled evaluation. The CLMS net impact estimates show a substantial positive postprogram impact for classroom and on-the-job training over the first two years after enrollment, whereas adult work experience shows a deficit. But what the prime sponsor learns from the local evaluation system is the immediate placement and positive termination rate. For instance, for 1976 participants, the immediate placement rate was 54 percent for adult work experience participants and 29 percent for those in classroom training. Three months out, the differential had narrowed to 52 percent and 46 percent. From the CLMS data, it is apparent that the trend continues with the employment and earnings gains of the trainees substantially exceeding those of the work-experience participants before the end of the first year.

In addition, work-experience programs produce for the sponsoring local organization an immediate, useful social product, totally at federal expense. And they do so at lower apparent cost. The prime sponsor cost for classroom training averages $7,694 per person per year, compared to $5,102 for work experience. The prime sponsor can enroll 159 work-experience participants for the same budget as 100 classroom trainees and get the cigarette butts in the park picked up at the same time. More voting constituents can be served by short-term, low-cost programs than by longer and more costly ones.

The same pattern exists for duration of training. There is a substantial gradient between length of stay and net gain, one that outstrips the rise in program costs. But that gain emerges slowly and can be identified only by lengthy follow-up and controlled comparisons. During the first quarter after termination, employment rates for those in training less than sixty days is 44 percent compared to 43 percent for those of over sixty days. During the second year after termination the comparison is 55 percent to

60 percent respectively, with 65 percent for those staying half a year or more. By implication from the CLMS data, the long-duration trainees also multiply their higher employment rates by higher hourly pay to arrive at substantial net income gains.

A different assumption seems to explain the lack of emphasis on OJT. OJT costs no more than work experience and has a higher immediate placement rate. It produces no local product for the public agency, but it does for the employing institution. The difference is in the marketing. Work-experience slots are secured in clusters from agencies that are usually not reluctant to receive the free labor and the slots obtained are refillable. Reluctant private employers must be pursued with not only a separate contract for every job but for every separate individual in every job. Work experience pays 100 percent of costs, whereas OJT pays 50 percent of wages. OJT also has competition from the Targeted Jobs Tax Credit Program through which the employer can screen, sort, and select a preferred Supplementary Security Income recipient, ex-offender, Vietnam veteran, out-of-school youth, or others and have them certified after selection. In communities with the Youth Incentive Entitlement Program, 100 percent wage subsidies have been available.

All in all, it is not surprising that prime sponsors often make different choices than wise academicians would advise them to.

EXPLANATION OF RESULTS

CETA's results appear positive compared to costs for all of those components designed to improve employability by building skills and changing attitudes or to provide access to the mainstream of the labor market. That is not so for those components that offer work experience in something different from a normal job environment. Each component must be examined individually for the explanation of its impacts and its potential for disadvantaged youth.

Success of Job Corps

Job Corps is unique among CETA's components in that it has had fifteen years of continuous experience and attention under centralized national supervision and decentralized private operation. It has had its ups and downs, its expansions and contractions, and its near demises.

But Job Corps administrators have learned from their experiences, and all lessons are disseminated among and shared by all centers. Job Corps has the dual advantages of centralized guidance and technical assistance and decentralized innovation and experimentation, the results of which can be retained, built upon, and quickly shared throughout the system.

It serves a very disadvantaged population, all poor, overwhelmingly minority, 85 percent less than high school educated, 25 percent military rejects, and 40 percent with arrest records. But in a residential setting it has been able to deal with their problems. Its gains have been from long-term rather than short-term training. Forty percent of the participants leave within ninety days and another 30 percent before completion, making the average stay six months. However, the average completer spends 1.2 years in training. Hence the Job Corps has a built-in self-selection process. On the average, female enrollees have gained from training short of completion, but only those males persisting to completion have earned more in the postprogram period than their controls. Those who are not likely to be successful drop out early, leaving those most likely to succeed both in the Corps and in the labor market.

The residential setting makes it possible to involve the Corps member in informal life-adjustment activities as well as in remedial education and skill training. Assessment also becomes possible to determine who can profit from long-term training, and who should pursue an early return to the labor market.

Although it has been necessary to eliminate many frills and desirable activities to bring the per participant per year cost down from $20,000 per year to $13,000, that level of expenditure is sufficient to maintain a high quality of facilities, equipment, and curriculum material. The private sector setting has also proven generally less bureaucratic and more flexible than the public schools and postsecondary institutions. The long duration has also helped in accumulating a dedicated staff. With time for development, intercenter sharing, and a less restrictive cost structure, it has been possible to adopt from other fields of education and improve upon such innovations as computer-based instruction, competency-based curriculums, and individualized and self-paced learning.

One of the major experiments under Job Corps has been a test of computer-assisted instruction—where lessons are provided on a terminal with which the student interacts, rather than using printed materials alone—and computer-managed instruction—where the diagnostic tests are taken on the terminal, the results analyzed by the computer, and the individual assigned to either computer-assisted lessons or printed materials. The gain scores of participants over ninety hours were 1.5 years in reading and 1.0 years in mathematics. Where GED materials were provided, the preparation times were substantially shortened. Attendance also increased because of the attractiveness of these new "toys." Feasibility has also been carefully studied and systems modified accordingly. There have been experiments with networks of terminals through a community and even with several Job Corps centers all tied into a single minicomputer.

More recently, the same systems have been experimentally mounted in the case of several prime sponsors, with terminals provided to training institutions. The available materials provided through the computer include the Job Corps reading, mathematics, and GED program, and a variety of materials developed elsewhere. Those are being supplemented by a competency-based world-of-work package and several vocational packages. Because of the rapid decline in minicomputer and terminal prices, and with the increased diversity of materials that are presently available, it is possible to deliver self-paced, individualized educational instruction (and basic life-skills training) in any setting where there is a telephone to link a terminal to a central minicomputer, i.e., at almost any site where employment and training activities are taking place. The costs of such offerings, particularly the marginal costs of adding extra terminals, are low.

In other words, there may be an untapped potential to use the technical and cost advantages in the computer field to deliver remedial instruction of demonstrated effectiveness as a component of all CETA activities. Since only a minority of those CETA participants with educational deficiencies receive any education assistance, this could offer exciting possibilities, particularly for work and education. Further, the systems can work with adults as well as youth, and are particularly effective in delivering more advanced (GED level and beyond) instruction.

Another successful and impressive experiment has enrolled several hundred carefully selected Corps members at various colleges after having completed prerequisite Job Corps training. Some have continued to be housed at the centers while being bussed to school, whereas others have lived on campus. The two important findings were that (1) the average member of this selected group performed equally with the average regular student of the college, and (2) the support supplied by the assigned Job Corps center was an important determinant of the continuance and performance of the Corps member. For a selected group, a "quantum leap" from their backgrounds is possible.

The national focus has freed the Job Corps from local politics and from limiting its clients to those from the local scene. On the other hand, it has had a negative effect on the development of an effective placement system. Above all, the Job Corps demonstrates the advantages of a relatively stable but flexible institution-building system. It also proves that occupational training alone is not enough for youth from such environments. Judged solely by the earnings increases experienced contrasted to comparison groups, its costs exceed its benefits. It is the savings from reduced criminal activity, reduced participation in alternative social programs, and the value of the work performed by Corps members during the enrollment that fill the benefit gap and make the program a profitable social investment.

The Quality of Other Training

A clue to understanding the positive but modest results of society's investment in CETA classroom training is the consistency of those results with the experience under MDTA. Numerous studies during the 1962-72 period, with and without comparison groups, placed the benefit-cost results of classroom training between 1.5 and 3.5 (The Urban Institute 1971). The 1.14 estimate of this paper is at the lower end of the range but is more conservative in its estimate of the erosion of the earnings differential over time than were the earlier studies. The inflation factor also seriously reduces the present value of the future income stream.

The explanation of the similarity is simple. Little has changed between MDTA and CETA's employability development components. There is still only classroom and on-the-job training. Classroom training still occurs primarily in the same institutions, though there has been some shift in the mix to emphasize referral of individuals to ongoing skill-training programs in contrast to establishing class-size groups of CETA enrollees. The training occupations are still largely the same, dominated by those characterized by high turnover and short training times. Nevertheless, access to a substantial number of new occupations has been opened through individual referral. The enrollees are still economically disadvantaged workers, a high proportion of them youth. Subsidies for on-the-job training still function primarily to buy a job with a marginal employer, but outstanding examples are available of linked sequences of remedial education, classroom skill training, and on-the-job training leading to high-level jobs. Training is also available in communities that never before had it. A major change has been the emergence and expansion of the various forms of nonoccupational training.

Because of the tremendous diversity that characterizes the CETA scene, there is no general source of data on the nature and quality of CETA training. However, insights are available from twelve recently completed case studies of representative prime sponsors.*

To adapt a popular comic routine, the good news is that, judging from the twelve observations, the quality of training under CETA is generally high. The bad news is that quality is often an accident. By and large, the quality of the classroom training provided is high because there are high-quality public and private training institutions in most communities, and because these are all that is available, the CETA prime sponsors contract with them or refer enrollees to them for training.

Many factors enter into an assessment of training quality: the adequacy of the facilities and the equipment, the curriculum, the competence of the instructors, the appropriateness of the occupations, the adequacy of training duration, and the quality of the needed supportive services provided. The characteristics of the clients will have a substantial effect on the training and supportive services required, and the degree to which services are adapted to client need is a critical aspect of quality. The management of training, including the linkages among services and with employers, affects outcomes no less than the training itself. Of course, costs are both a determinant of quality and a yardstick against which to measure effectiveness.

Seldom in the twelve case studies could examples be found wherein the prime sponsor justly took credit for creating or enforcing the occupational training quality. At times, prime sponsor staff demonstrated acumen in choosing between alternatives of high and lower quality. In some cases, particularly rural areas of Maine, Michigan, North Carolina, and Utah, there were no choices and the prime sponsors were lucky that the quality of the available institutions was generally good. In some isolated areas of these states there simply were no training institutions available. In those situations, the choices were to rely on work experience or on-the-job training (though potential host employers were also scarce) or to pay costs of transportation and lodging at a distant site. In most cases, at least some monies were allocated to institutions of lesser quality for political reasons, to maintain a range of alternatives, or because of the particular attachments of institutions to race, sex, or other groupings among the eligible population.

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*The twelve locations were: Seattle, Washington; San Francisco, California; Tucson, Arizona; the full state of Utah; Dallas, Texas; Ottowa County, Michigan; Indianapolis, Indiana; Montgomery County, Maryland; Baltimore, Maryland; North Carolina Balance of State; a three-county consortium centering on Penobscott County, Maine; and Worcester, Massachusetts. These were studied under the sponsorship of the National Council for Employment Policy. The case studies and analysis will be published by W. E. Upjohn Institute for Employment Research.

Institutional quality. CETA introduced a new form of decision making but created few new institutions for the delivery of employability development services. Therefore, it is useful to describe those which emerged under previous programs and continue to dominate the field. CETA training occurs in five settings:

1. In public vocational and technical schools, either in class-size groups of CETA participants or by individual referral of CETA participants to postsecondary vocational classes serving the population at large
2. Individual referral to private proprietary schools
3. Skill centers specially designed under MDTA to serve a disadvantaged population
4. Training activities under the auspices of community-based organizations representing various racial, ethnic, or sex groups
5. On the job in an employing establishment

Although CETA uses all of the same institutions of its predecessors, there has been a substantial shift away from the skill centers and class-size vocational school courses toward individual referral to public institutions, private proprietary schools, and community-based organizations, the latter particularly for nonoccupational types of training.

How valid the second chance is for disadvantaged youth is heavily dependent upon the quality of the institutions within which that remediation occurs. In purely quality terms, the best institutions were those that were created to appeal to the broader, nondisadvantaged population in the community. At the head of the quality list tended to be the private proprietary trade schools that depended upon a combination of high-quality training and good placement rates to maintain a clientele and make a profit. Attractive facilities, up-to-date equipment, high-quality staff, sound and motivating curriculum, and high placement rates are all necessary to continue to attract tuition paying customers. However, this quality comes at high cost to CETA, both in budget dollars and selectivity of enrollees. Few CETA enrollees can meet the entry requirements of such schools on an individual basis. Pressures from the Federal Trade Commission to advertise their placement rate make such schools reluctant to accept the hard to place. A screening of 1,100 CETA-eligible applicants resulting in 33 whom a technical school would accept for a biomedical technician program is an example. Another was an abortive effort to place a CETA class in a private business school where the instructional and administrative staff was never able to establish rapport.

There are those among the CETA-eligible who can qualify for and survive at such institutions, as both of these cases attest. There are also private training institutions capable of serving well a broader portion of the CETA population as illustrated in others of the case studies. For the CETA-eligible who can qualify, these appear to be good investments because they train for the mainstream of the labor market, train for longer periods of time, and provide access to jobs that pay enough to break the dependency cycle. But selection must be made with care and the prime sponsor must maintain a liaison with and access to external supportive services that increase the chances of survival.

Next in quality ranking appears to be the community colleges, technical colleges, and area vocational schools appealing to the broader mainstream population. Whatever the absolute quality, there is generally no better relative quality available in the United States than what is found in this range of postsecondary training institutions. There has been a vast expansion and qualitative upgrading in such institutions in recent years. The facilities and equipment are generally of high quality, and the occupational offerings tend to be broader than at the proprietary schools. In CETA terms, the costs are advantageous also. CETA enrollees are generally charged only the heavily subsidized tuition required of the individual, standard student.

Most such institutions, designed to serve taxpayers and the children thereof, follow fairly open-entry policies. Most CETA enrollees can gain entrance, though some may not. The general problem is one of survival once entered. The institutions have adapted to the average or above of the high school graduate population. They rarely have available remedial adult basic education, English as a second language, close counseling support, and other supportive services likely to be needed by the CETA population. It was found during the MDTA period that the referral of individuals to mainstream training programs generally resulted in enrollment of a better educated, more likely to be white, and more middle-class group than the average in the eligible population. That still seemed to be the case in 1980.

But for those who can survive in that setting, the choice is a good one. Not only is the training of generally high quality but the CETA enrollee is more likely to be brought into contact with the primary labor market through this route. Most such schools have informal and formal employer contacts within the industries they serve. The enrollee emerges from a well-reputed institution rather than from a possibly stigmatized federal program. The enrollee may well be inspired to a higher self-image as well.

As the cases illustrate, some of the survival problems for CETA enrollees in these mainstream institutions can be minimized by a prime sponsor staff that works closely with the training institution to which it refers individuals. The options are to persuade the institution to mount its own supportive services activities, to allow the outstationing of agency personnel at the training institution to provide the social services, cr to orchestrate the enrollee's program in such a way as to provide access to supportive services external to the training institution.

Continuing the hierarchy of quality, the third tier appears to be the skill center. As noted, these hearken back to the Manpower Development and Training Act days when they were designed specifically to meet the needs of a training clientele who either could not get into or survive in the mainstream institutions. They are typically designed around an open-entry/open-exit concept in which an enrollee can enter regardless of background, obtain remedial education and advocacy counseling, enter a modularized and individualized training sequence without waiting for a far-off starting date, progress through preparation for a cluster of related occupations, and leave for placement upon having progressed far enough to find a job, having reached learning capacity, or upon being pressed financially. All the necessary remedial and supportive services, including placement services, are designed to be available on-site from dedicated skill center staff or outstationed staff of other agencies. However, skill centers suffer in the quality of their facilities, as they are relegated to abandoned schools and other unused buildings. They also tend to be limited to occupations for which entry for a disadvantaged person can be attained in an average of less than six months and a maximum of nine months of training. All of these conditions still exist with some exceptions as demonstrated by the case studies.

As to equipment, the situation is clearly more difficult under CETA than under MDTA. MDTA funds could be used to purchase equipment that was then often used for the training of non-MDTA enrollees in off hours, making MDTA participation more attractive to educational administrators. A federal Office of Manpower Development and Training existed in the U.S. Office of Education to ensure that MDTA operators had access to surplus federal equipment. Under CETA, cost-restraint pressures have discouraged investment in either facilities or equipment. Generally, CETA funds are used only to pay for training costs, and the institution acting as training contractor is expected to provide its own facilities and equipment. Private schools, of course, charge enough for their training to cover amortization. As noted above, public educational institutions provide a substantial subsidy to CETA through free use of facilities and equipment as well as through tuition charges, which are well below costs.

CETA is almost entirely helpless to provide training in areas where no effective training institution exists. It does not have either the authorization or the resources to create its own facilities, as often occurred under MDTA. The problem is most critical in rural settings that must either accept the available institutions (if any), limit the program to work experience, or accept the expense of travel and living costs at some faraway institution.

It is with some trepidation that one describes the training provided by community-based organizations (CBOs) as the fourth tier in quality. A few are excellent, both in facilities and performance. However, CBOs generally operate out of haphazard facilities—just as skill centers do. High-quality training can occur in a substandard facility. Quality relates more to what the training program is trying to accomplish. The comparative advantage of CBOs is in terms of racial and ethnic identity. They tend to have an edge in outreach and intake. CBOs were found in the case studies to do a generally excellent job of teaching English as a second language, a task for which their identity prepares them. The quality of their adult basic education, job search training, and other prevocational training was mixed, depending more upon the capabilities of the staff than the institutional attachment. Few CBOs attempt to do classroom training and, where they do, their facilities are generally substandard and the equipment minimal. The quality of their training is spotty because it tends to depend more on the charisma and the commitment of staff than on the institutional connection. On the other hand, CBOs tend to be strong in generating racial and ethnic pride.

Contracting with CBOs for CETA services involves more than straightforward judgments of training quality, however. One motivation is simply political. CBOs tend to be good at focussing pressure on CETA staff and elected officials to win a place on the list of CETA contractors. There is also a highly positive aspect to the CBOs' racial and ethnic identity, which appears to be more important the smaller the proportion of the population any particular racial or ethnic group may be. It provides a sense of identity and a visibility for individuals who might otherwise get lost in the masses. In some localities it is probably worth funding such organizations for that reason alone.

Curriculum quality. The best curriculum is generally that which an alert instructor devises to fit the needs of the specific students and institution by adapting tested and proven materials under the guidance of an experienced curriculum supervisor. By those standards, most of the occupational skill training curriculum was sound. The training institutions, with few exceptions, were either private proprietary schools under competitive pressure to maintain attractive and effective curriculum, or units of public educational systems that maintained curriculum libraries and curriculum directors. For individual referral, the curriculum under which CETA enrollees were being instructed was the same as that experienced by those in the mainstream of training in those communities. Most of the skill centers were stepchildren of their systems, but they did have access to those curriculum exchanges and generally had their own curriculum directors. The instructors tended to be limited in their formal training as teachers and, therefore, in their formal training in curriculum development. But that was offset to a substantial degree by the range and depth of their practical industrial experience. Thus, the quality of occupational skill training curriculum appears to be generally good, though each institution was being forced to adapt de novo from curriculum materials prepared for the mainstream. A system of sharing curriculum within CETA training circles would have been of considerable value.

Curriculum weaknesses were most notable in the nonoccupational training components. With the rising educational attainment of the population, rising expectations of employers, and the influx of foreign workers, the following have been the dramatic growth areas of CETA: remedial basic education, English as a second language, vocational orientation and exploration, job-search training. Community-based organizations without professionally trained staff or linkage into system support provided much of this training. But even under sound institutional arrangements, the services in these areas are new and the curricula are at a rudimentary stage of development and heavily dependent on the accidents of personality.

Curriculum for remedial adult basic education is now reasonably well developed and available "off the shelf" from several commercial publishers and educational systems. English as a second language (ESL) is beginning to approach that status with an informal network of exchange among practitioners. Fortunately, a separate curriculum does not seem necessary for each language of origin. The anxiety of the immigrant enrollees for progress and the ethnic identification of instructors are undoubtedly positive qualitative factors.

There is little commonality among curricula for vocational orientation, motivation, and various coping skills such as grooming, personal finance, and how to access public services. The goals of orientation are not clear, and even high-priced consultants to industry do not know how to motivate employees.

Job-search training is too new to have developed an acceptable curriculum. Most of the literature in the field was developed in support of career choice and access to professional jobs by college graduates and displaced executives with limited relevance to a CETA-eligible population. Consulting firms have begun to compete vigorously for assignments from CETA prime sponsors, but many unresolved practical and philosophical issues as to curriculum approaches remain. Quality at this point is likely to rest more with the charisma of the workshop leader than with curriculum content.

Notably missing from the CETA scene is institutional support for curriculum development and dissemination as well as staff development. The Area Manpower Institute for the Development of Staff (AMIDS) provided such support in the MDTA years. An advantage to the DOL/HEW partnership of that program was the fact that the education partner was sensitive to inservice staff and curriculum development needs and established a national network for it. The DOL regional training centers have had neither the awareness nor the expertise to provide the needed support.

Staff quality. Much of what has been said of curriculum could be repeated for staff. The proprietary schools must have staff who can attract and hold customers. The mainstream public institutions have credentialed instructors who often must combine industry experience with professional training. They tend to have a strong commitment to excellence but limited sympathy with departures from their norms. Skill centers are generally blessed with dedicated instructors of extensive industry experience, limited as to credentials but committed to elevating a disadvantaged clientele. The CBOs have been characterized by low-paid, inexperienced, and inadequately credentialed but dedicated instructors and staff, with some tendency to generate opposition rather than adaptation to establishment institutions and customs.

Adult basic education and ESL tended to be exceptions where well-trained and competent people were available to serve on a part-time basis; but, in general, staff development seemed to be seriously lacking in the CETA training system. For institutions outside the training mainstream, including skill centers, there is ordinarily no requirement for preservice teacher training and no linkage to ongoing inservice teacher training and staff development systems. There are no funds or provisions in CETA contracts for upgrading of contractor personnel. There is nothing of the leisurely pace of public education present. Instructors work longer hours and for the entire year. They are paid for classroom hours and have no built-in incentives for self-development. The generally high quality of instruction must be attributed to personnel dedication rather than to institutional incentives.

Occupational quality. Three-quarters of MDTA enrollments were in seven occupational areas: clerical, health care, automotive repair, welding, machine operation, food service, and building maintenance. Based on the twelve observation sites, CETA appears to have expanded its offerings primarily by utilizing individual referrals. Still, CETA enrollees have limited access to occupational training because the enrollments are normally restricted to no more than one academic year, 5.5 months being the average course length, although the law provides for two-year training. One prime sponsor adapted to that problem by paying for one year of training but enrolling CETA clients in two-year programs with the understanding that they had to pay their own way the second year. The availability of basic education opportunity grants facilitated that approach, which was used extensively in other locations. One academic year or less of enrollment in a standard low-tuition public institution occupational program was generally available for those meeting both CETA eligibility and the institution's entry requirements. Except in areas with a generally high average level of education such as San Francisco, Seattle, and Utah, the number who could qualify for these individual referrals was limited, but those latter areas generated waiting lists of such applicants.

A few prime sponsors generated class-size CETA projects within mainstream training institutions in medical, computer electronics, and other technologies, but most of these were under the Skill Training Improvement Program (STIP) that had its own separate, more generous funding and less restricted eligibility than the run-of-the-mill CETA training.

The skill center programs offer occasional departures from the standard meager menu because of the special and temporary employer need, but the pressures for short training time, low training costs, and easy placement create a centripetal force back to the basic grouping. Departures from the standard offering in response to an observed labor market need frequently result in good placement rates for a short time, only to fill the need, and then continue to produce a surplus of trainees until the fact is noted and the new course is dropped. The high turnover entry occupations also tend to be the ones with persisting demand.

Thus, it can be said that a dual system of occupational training exists under CETA: (1) a program of short duration, class-size training activities of generally high quality adapted to the needs of the disadvantaged but limited to the few traditional occupations in skill centers inherited from MDTA, and (2) an extensive, wide-ranging individual referral program in mainstream training institutions, limited to those members of low-income households capable of benefitting from a standard but still short-duration training course leading to employment in a mainstream occupation. Every prime sponsor studied had some of each but with very different emphases. The choice seemed to be determined more by the availability of institutions than the needs of the clientele since there were ample numbers of applicants for either training emphasis.

Supportive services and nonoccupational training. The emergence of the MDTA skill centers in the 1960s reflected the need for a range of supportive services to make occupational training possible. The preparatory services included: prevocational orientation to aid in the choice of training occupation for those with limited labor market exposure, remedial basic education, child care, transportation, counseling to solve personal problems, and training allowances for family support. CETA continues the same package of supportive services but with two significant differences: (1) the support services are less likely to be available in a single setting, and (2) the emphasis shifted from the services necessary to make occupational training possible to the attributes necessary for successful labor market participation, whether or not the individual has undergone occupational training.

Counseling remains a supportive service taken on faith in absence of any strong evidence as to the extent to which it makes a difference. Adult basic education, along with GED, appears to have improved substantially, with better trained instructors and a growing professional interchange of curriculum. The best practice seems to be a learning center to which enrollees can be referred when they run into basic education difficulties, remaining only until that problem is solved.

It is difficult for the external reviewer to assess the quality of the English as a second language programs. They are performed by a variety of new and obviously rudimentary training institutions. Yet a common curriculum is emerging, and the results indicate that the approach is sound.

Training for job search is a recent development and the practitioners have not yet articulated a common curriculum. The key skill elements are telephone ability to obtain interviews and interview skills to impress the employer. Some workshops were conducted with great enthusiasm, and others very prosaically, but the results are impressive. Orientation and motivation activities were too diverse and amorphous, leaving assessment of the approaches a matter of faith.

Need for transportation assistance was significant only where public mass transit was not available. Child-care facilities appeared not to be a serious problem. All in all, the nontraining supportive services seemed to be less in demand than they were a decade ago, but the nonoccupational labor market skills have become far more important.

OJT Quality

According to the prevailing rhetoric, everyone's favorite program is supposed to be on-the-job training. It was, therefore, somewhat of a surprise that the prime sponsors seemed to exert little effort to implement OJT programs. It appears that OJT was offered to round out the range of available services and was primarily treated as a purchased placement with little effort to ascertain or enforce training content or quality.

CETA prime sponsors are usually one step removed from OJT employers. The prime sponsor contracts with a CBO, the local employment service, or the local National Alliance of Business chapter to contact employers and to place CETA-eligible enrollees with them. There is no good way of getting at the issue of the quality of training provided. On-the-job training may be totally informal, with a supervisor or fellow worker keeping a watchful eye on the participant and providing timely assistance. The issue of most concern is, did the employer hire a CETA-eligible person because of the training subsidy, rather than a noneligible who would otherwise have gotten the job?

The exception to that general rule was the rare, high-support OJT program wherein the efforts of the employer were linked with those of a contractor in preproduction classroom or vestibule training components prior to entering the actual job. These situations were difficult to work out but highly productive when they were achieved. Retention in well-paid jobs and breakthroughs into industries and occupations not generally accessible to CETA enrollees were often the results of the approach.

Beyond those exceptional examples, OJT was a useful but routine component of each CETA scene. Its high benefit-cost payoff noted at the national level was less apparent locally where the difficulty of marketing OJT, the one-on-one administrative expensiveness of the contracting process, and the reluctance of any but the most marginal employers to participate were offsetting disincentives.

Linkages and sequences. A significant consideration in assessing the quality of a CETA training program might be the degree to which it is linked with other CETA components, with programs in mainstream education institutions, and with employing organizations. The absence of such linkages was one of the disappointing findings of the study. An advantage of decentralized administration should be the ability of the prime sponsor to orchestrate passage of the eligible enrollee through a sequence of locally available services, starting from the enrollee's initial need and completing with the attainment of employability and a job. Such sequencing was rare. The general tendency was to make one program referral per enrollee and to provide nothing further, except perhaps placement services after completion. There is no legal or regulatory obstacle to starting an individual in English as a second language and adult basic education at one institution, moving that person to skill training at another, then perhaps to an on-the-job training stint, and even to job-search training at another institution as needed. The obstacles are logistical and financial. Keeping track of clients is troublesome within a reporting system that treats every component as discrete. It requires an excellent client tracking system to accomplish the logistics. The financial issue is the amount of money to be spent per individual in the total amount of time necessary to traverse the complex programmatic terrain.

Only three of the twelve prime sponsors that were studied centralized their intake, and two others centralized intake for major portions of their clientele. The norm was for each service deliverer to be responsible for its own recruitment and selection of clients. Consequently, the enrollees' access was limited to the services available to the contractor. Some means of assessment were also necessary to decide who needed what and to refer the applicants where the needed services were available. Yet assessment centers were available to CETA enrollees in only two of the twelve areas studied, and then through subcontract rather than central CETA staff. The others made referrals based more on the availability of openings or enrollee choice than on any objective judgment of special need.

The standard practice of the prime sponsors studied was to provide no employment and training services directly. Only the skill centers provided both nonoccupational and occupational training within the same training institution. Most other institutions performed only one or a limited range of services. Without centralized intake centers, there was no means of orchestrating a needed sequence of services to be supplied in turn by a sequence of service deliverers. Without a centralized intake and assessment source, each contractor had every incentive to keep its applicants inhouse and little or no incentive to refer them to other institutions for alternative or supplemental services.

Enforcing Training Quality

The twelve case studies were enough to indicate that federal administrators had no way to get at the issue of training quality. Few prime sponsors had much concern with it, and even fewer appeared to have staffs qualified to assess it and recommend improvements in it. Even training experts seemed to have no clear definition of quality training. There were exceptions in terms of prime sponsors who insisted upon quality and set up a system of competition among potential providers to achieve it. The only prime sponsor staff members with a continuing assignment for direct on-site observation were the program monitors, but this is the entry-level position wherein inexperience is inherent and is characterized by high turnover—either up or out—which prevents the accumulation of experiences upon which to base valid judgments. As a result, training quality appeared to be more often an accident of institutional availability. Fortunately, the accident happened more often than not, so that one can report favorably on the general quality level of CETA training.

THE YOUTH PERSPECTIVE

Assessing the quality of CETA training institutions and curriculum does not fully explain their relative effectiveness for youth. Classroom training, as noted, is generally of sound quality. Yet it offers little payoff for the 35 percent of its enrollees who are under twenty-two years of age. The very young do well in classroom training compared to control groups of older individuals, not because they are more stable than the older teenagers but because anything is better than nothing. While the payoff for youth eighteen to twenty-one increases dramatically with the duration of training, youth are prone to enroll in the shorter courses and to drop out of those. Remembering that over 40 percent of all classroom trainees in 1980 were already high school dropouts, something less than stable enrollment is to be expected. Data cross-correlating duration with age might show a quite different picture for those youth completing the longer-term programs.

While it is by no means certain, another problem may be the allowance structure that has emerged under CETA. Whereas under MDTA adult enrollees received an allowance equal to the average unemployment compensation in the state plus certain supplements, youth received only $20 a week because Congress did not want them bribed to leave school. Under CETA, enrollees of every age receive a stipend equal to the federal minimum wage for each hour enrolled. For many, that is more money than they ever earned before, and for some it may be more in take-home pay than they will earn after completion of training. Some may enroll for the stipend without serious commitment to training and employment.

On-the-job training is a high payoff experience for youth, but it is difficult to persuade employers to accept them. Even 75 percent and 100 percent subsidies in experimental programs found relatively few employer acceptances, though each increase in subsidy was followed by a substantial increase in the proportion of employers willing to participate. The major objection of employers is not to the job performance of youth but to their instability. Yet the payoff in introducing disadvantaged youth into the mainstream of the labor market and giving them real experience with real jobs is worth the effort, even at full subsidy or even more.

The experience of youth in public service employment as contrasted with work experience illustrates the same principle. PSE consists of a real job in the mainstream of the public sector with a reasonable chance of transition into permanent employment. Even if the youth does not continue on the job, the experience has been sound and begins or furthers a necessary process of work establishment. Work experience programs, with notable exceptions, do not seem to be taken seriously as real jobs by the youth, their supervisors, or future employers. Yet for the very young, their first work experience seems to have a positive effect, even if it is no better in quality than that provided to those a couple of years older. Thus, work experience has proven useful for school retention and crime prevention but has contributed to the employability development of only a few. Only when enriched and integrated into a training sequence does it seem to serve a long-term employability development objective.

The nonoccupational training areas are more "iffy." Remedial basic education and English as a second language are necessities for those who lack them. Job-search training appears to be a universal need. Other experimental and pilot projects have shown promising possibilities for attitudinal change and employability development and now need testing and proving in more institutionalized settings. However, it is not clear which would work best in a CETA setting and which in a school or other alternative setting.

A SECOND CHANCE FOR DISADVANTAGED YOUTH

Conclusion

CETA does provide a second chance for disadvantaged youth, but not a very coherent one. Job Corps is the only exception to that statement among CETA's components. It has provided an outstanding remedial service for that small group who (1) needs a residential setting, and (2) has the endurance to continue in that setting for a year of training. Its continued challenges are its high dropout rate and its placement process. The first is probably irremediable, short of some preselection factor that fills a screening role. The second may be solvable through a combination of job-search training and linkages with placement intermediaries in each Corps member's intended community of residence.

CETA's Title II-B discretionary programs serve many youth, but only incidentally. The programs are not designed explicitly for that purpose, though a youth-serving model could be designed which could be installed universally with appropriate local adaptations. The Title IV youth programs have been a mixed bag of large-scale applications of an uninspired version of the adult program and some innovative and exciting experimental and pilot projects, some successful and some not.

However, the institutional base is there upon which a coherent second chance system could be built.

Recommendations

CETA should continue and improve itself as the only generally available second chance system of employment and training for the low-income population. As such, it cannot restrict itself to youth but should have components explicitly designed for them, either in a separate youth title or a recommended youth model within a general title. Leaving aside Job Corps, which continues to move in the right direction under national guidance, the following should be accomplished for, with, and by prime sponsors:

1. A youth model or models should be designed and promulgated but not forced upon prime sponsors for adaptation to their local needs. They should not be left to invent their own duplicatory systems as some will or to ignore the problem as will others. Those with the innovativeness to design their own, as many have, should be used as sources for the nationally recommended designs. The national obligation should involve technical assistance in the installation of youth models as well as their design and dissemination.
2. The CETA employability development system should be restricted to out-of-school youth. The Summer Youth Employment Program and other work experience activities for those in school are appropriate CETA assignments because of the need for linkages with host agencies and for supervision and assurance of work site quality. However, education and training for those in school should remain a responsibility of the education system, though not necessarily within the traditional institutions. YEDPA provided a significant service by funding such alternative school experiments as the Career Intern Program. However, having demonstrated their effectiveness, they should be underwritten and operated by the local schools. CETA's role vis-à-vis the school should be coordination in providing work experience accompaniments to education but not the operation or subsidy of the classroom. The out-of-school assignment is too large and resources too scarce to attempt to subsidize or substitute for the schools.

3. Classroom training should be available under CETA sponsorship only for carefully selected youth who give evidence of taking it seriously. A major step in this regard should be allowance reform. The stipend itself should not become a motive for enrolling in training, though it can be structured so as to provide an incentive for achievement. There should be a small basic allowance for out-of-pocket training costs. There should be available an additional subsistence allowance based on need in relation to family income. Finally, there should be available a variety of monetary incentives payable only upon explicit accomplishment, including persistence in long duration training.

For those selected for training, there should be a two-tiered system consisting of (1) basic career entry training involving a combination of basic education, job-search training, career exploration, and attitudinal development taught in a work-related environment and linked with either work experience, on-the-job training, or rudimentary skill training, and (2) career development training available for up to a total of two years but limited to those who successfully complete the entry-level stage or manifest a good work record and show promise of persistence and performance at the higher and intended level. The first should occur in institutions such as skill centers sympathetic to and effective with the special problem of the disadvantaged. The career development phase should occur in mainstream training institutions in which the CETA-funded students compete on an even footing with others, though with additional tutoring if necessary. Both should be competency based and buttressed with firm but achievable performance standards.

Given the present knowledge and motivations of prime sponsors, such a two-tiered system will not be put in place unless funds are earmarked for that purpose. The ideal level can only emerge from experimentation, but an allocation of 10 percent of Title II-BC funds would be as good a level as any for a start. The two-tiered training system should be available for all age groups, with the greatest payoff probably coming for those over twenty-one years of age. Nevertheless, youth who have proven their ambition by conclusion of a first tier of training sequence or by stable employment will probably show gains equal to their demonstrated maturity. Prime sponsors are not deliberately resistant to long-term training. They simply need a data source that demonstrates its payoff, policies that signal its endorsement, and an incentive system that rewards its use.

4. On-the-job training should be promoted as a route for youth. A fully subsidized tryout period during which the enrollee is totally supported by CETA and is not on the host employer's payroll until proven acceptable might make the process more attractive to the employer. So might a short preemployment period of rudimentary training in work procedures, discipline, and basic education before placement along with related classroom instruction in off hours at no expense to the employer.
5. Public service employment should be used as on-the-job training in the public sector for youth. If funding is not restored to Titles II-D and VI, it would be worth expending some Title II-B funds for such efforts. Current restrictions should be modified to make PSE available as long as it is clearly of an OJT nature. With both private and public sector OJT and with job placement in general, practitioners of the labor market arts should forget most of what they have learned about secondary labor market jobs. Though one must guard against individuals becoming trapped in that market, it should be generally recognized that any employment experience is positive for those who have never had any. Career exploration, work discipline, and an employment track record can be products of any job. Just learning what one does not want to do with one's life is a positive accomplishment.
6. Work experience should not be abandoned as a type of training, but should be structured into a sequence of positive employability development experiences, especially for the very young. The harm of work experience comes from abandoning youth to unstructured, nonproductive, and often unsupervised activities that give a false sense of what a job requires. Realistic work experience, especially when linked with basic education and classroom and on-the-job training, should have a combination of the advantages of them all.
7. Job-search training is of sufficiently universal value that it should be available to all youth. It should include understanding of labor market structures and dynamics on a very practical level, criteria for choice among industries, occupations, and employers depending upon the job seeker's objectives, as well as the techniques of job search. Such training must be at least as important to any youth's future as the ability to drive an automobile, and job-search training should be at least as ubiquitous as driver education. The schools are the appropriate training site for those in school. For out-of-school youth and adults, there is no more logical institution than the public

employment service, which should offer brief job-search training to all and longer duration training at CETA's expense for those eligible. The employment service generally has the capability; its major obstacle is a perverse budgetary system that denies to the employment service continuation of funds spent to train workers to seek their own jobs. That is a system weakness obviously demanding remedy.

8. There are a number of innovations within the Job Corps experience potentially transferable to a more general CETA youth model. One lesson of significance is the need for and futility of trying to substitute at the local level for an intensive, residential, nationally directed remedial institution. Job Corps offers a supportive mechanism for geographical mobility for those otherwise trapped by economic or personal circumstances. It offers structured interpersonal relations experience that is impossible in a nonresidential setting. It provides a complete spectrum of opportunities ranging from special aid to the learning disabled to college options for those of proven progress. If individuals cannot be served appropriately at one center, they can be moved to another.

   The centers operate under detailed national standards dictating minimum qualitative and quantitative inputs, and on-site reviews enforce these standards. Standardized competency assessment and progress systems allow comparison of educational and vocational gains across centers. Such intensive investments averaging over $6,000 per individual are only justified and possible where (1) the clients are extremely disadvantaged, (2) they have a high probability of significant gains, and (3) where a special institution is necessary to meet this special need. What is needed is better prime sponsor knowledge of and access to Job Corps. Many youth ought to move through local prime sponsors into the Job Corps system.

There are other Job Corps practices that may be transferable to the local prime sponsor setting. Job Corps has had the stability, funding, and economies of scale to introduce significant educational innovations. Instruction is individualized, self-paced, and competency-based; achievements are recorded and rewarded. The standardized educational programs are based upon a diagnostic, prescriptive, and progress measurement system. Relevant public and private sector materials have been screened and cross-referenced to this system, so that there are a number of options to suit the interests and needs of the individual. Each center supplements these basics. Likewise, training offerings are based upon a competency-based achievement standard for each vocation, with a record of progress for each individual. Each enrollee is placed according to ability or interest, can advance as rapidly as possible, and can compete for advanced opportunities in the system based on performance within the system. Financial and nonfinancial incentives based on measured accomplishments increase the effort of Corps members.

This approach is in marked contrast to CETA, which offers a "one-shot" treatment in most cases, with no incentives for performance and little allowance for variable activities. Yet all of these techniques are transferable to the CETA system, either by designing a system-wide approach across prime sponsors or by allowing individual prime sponsors to electronically "tap in" to the Job Corps system. Such transfer of the Job Corps experience to CETA should be undertaken experimentally and carefully monitored and evaluated. All of these innovations have worked well in the residential setting. Other innovations have been tried, found wanting, and rejected in Job Corps. That which has worked in the residential setting should certainly be tried in the nonresidential, but success is not guaranteed and adaptation may be necessary.

Job Corps computer-assisted and computer-managed instruction has another potential advantage for CETA. Performance data on individuals can be fed into the centrally linked automatic data processing system for recovery and analysis at the local level or the aggregation at the national level, offering individualized record keeping, a research data base, and a substitute for complex manual reporting. Technology and costs are now such as to make such a system conceivable across adjacent prime sponsors.

Finally, the CETA prime sponsors have important contributions to make to Job Corps. Recruitment and placement are the weak links of nationally directed programs. Job Corps recruits through its own system of contacts. Few sponsors use Job Corps as a treatment alternative on a regular basis. Some Corps members could be better served in local programs, whereas many participants in local CETA activities should be in Job Corps. Job Corps also has its own largely separate placement system that works in getting completers into jobs, but it does not help dropouts and partial completers for the most part (in contrast to local classroom training where placement is more often provided to participants whatever their duration of stay). As a result, many Corps members have a transition period of depressed earnings even though they may eventually break even or surpass like nonparticipants. This transition could be eased if local prime sponsors had the responsibility of placing individuals sent off to Job Corps for training and subsequently returning to the locality without a job. In other words, local activities must be better linked with nationally operated programs. They must begin to operate in tandem as a system rather than as isolated activities.

THE FUTURE

Employment and training programs have been dominated by youth issues throughout their history. These programs and the baby boom generation hit the labor markets together. Throughout the approximate twenty-year history the overwhelming problem has been integrating into the labor force a surplus supply of inexperienced youth. Therefore, just finding any means of access into any kind of job was considered laudable on behalf of those suffering the worst disadvantages in labor market competition. Youthful labor was a surplus problem, not a valued resource.

Now all of that is changing markedly. The number of teenage entrances will drop by over 2 million in this decade. Already a more capital intensive technology is beginning to replace the more labor intensive trends of the last twenty years. Skills requirements are persistently rising. The military will require a greater proportion of the emerging labor force cohorts and at higher levels of sophistication. Vast geographical shifts of population and production require greater mobility in the labor force and greater institutional means for accommodating it.

All this does not mean that the need for a second chance system for disadvantaged youth will disappear. Quite the contrary. Better opportunities for the nondisadvantaged may only cast into sharper focus the manifold handicaps of the deprived. It is the number of white teenagers that is plummeting, not the minorities, who will remain at a fairly constant level. The large central cities in which the low-income black and Hispanic populations tend to be trapped are the labor markets suffering and most likely to continue to suffer from the negative impacts of international competition. That is particularly true of the older industrial cities of the North and East. It is the youth with lower educational attainment, lacking the labor market access advantages of well-placed family and friends, who face the direct job competition with both documented and undocumented immigrants. A stark reminder of all this was the August 1981 black teenage unemployment rate of 45.7 percent. At that time, the average black youth was only one-third as likely to be employed as a white counterpart.

It is not that the task of remediation of the disadvantaged youth will become easier in the years ahead, but that success in that effort will become possible. The objective need not be just an income transfer through the facade of temporary public sector job creation. Career-oriented employability development can lead to economic independence for enough individuals and families to make of the effort a profitable social investment.

No system is ever good enough, and no group of human beings ever makes a perfect adjustment. Everyone deserves a second chance. The promising factor for the years directly ahead is that what has been a surplus resource will now be a scarcer and more valued one. What was once done largely for compassion may now be more economic. We have behind us twenty years of productive experience and a system in place that works moderately well. We are not faced with a de novo challenge of invention but with a process of improvement and adaptation. The costs of a coherent second chance system for disadvantaged youth should not be inordinately high, and the chances of success are substantial. Even in times of public frugality, it is well to keep in mind the longer-term consequences of budgetary restraint. Effective training systems are created slowly. Once destroyed, they do not reappear at the reverse twist of the appropriations faucet.

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MARVIN H. KOSTERS

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The CETA System of Job Training—Reactor Comments

The paper by Garth Mangum is a useful discussion of the various employment and training programs carried out under CETA, and it reflects the author's thorough familiarity with these programs and his extensive experience in analyzing them. The main thrust of the paper, as I read it, is that many of these programs have made worthwhile contributions and that those that have performed poorly should be improved. The implication is that these programs deserve continued public support, if not expansion.

My perspective on these employment and training programs is quite different. The first question I would raise is whether these programs have grown much too large. Several developments suggest the need to reexamine federal domestic spending priorities from this point of view. First, the number of teenagers is projected to decline during the decade from about 4 million youth at each year of age to about 3 million by 1990. Second, the current squeeze on federal spending growth will inevitably impinge on domestic spending programs other than transfer programs such as social security. Third, the Reagan administration has emphasized placing more responsibility at state and local government levels, and because youth training should be closely integrated with education, these programs would seem to be good candidates for state and local support.

Although I agree with the sentiment that "everyone deserves a second chance," these programs have grown much larger than would be suggested by a reasonable interpretation of this concept. First of all, according to the 1980 federal budget, "service years" of federally supported training and employment activities reached about 4 million at their peak in fiscal year 1979. Taken together, these federally supported programs could provide a second chance for literally everyone at least once in their lives. The discussion in the paper is oriented toward youth, of course, and in particular disadvantaged youth. According to the paper, youth enrollments (not service years) under CETA alone were about 1.4 million in 1979. Census data show that there were about seven hundred fifty thousand disadvantaged youth at each year of age in this country; each could almost cycle through the federal system twice according to these data.

Another perspective on numbers of youth for whom a second chance might seem necessary comes from data on activities of youth. There are about seven hundred fifty thousand youth at a given year of age right after high school who are unemployed, not in the labor force, and not in school. Only a fraction of these, of course, are disadvantaged. Disadvantaged youth who are neither employed nor in school number about one-half million. Each could cycle through a federal youth program three times, or if we exclude summer youth programs, each could get a second chance twice.

My point here is not that second or third chances are necessarily undesirable. My concern here is that these programs have become so large that instead of providing a second chance to youth who have slipped off the normal route to productive jobs or other activities, they have become a detour around the normal school-to-work transition for a specific segment of society. This development of a separate channel for these disadvantaged youth poses the danger that it may become or be perceived to be an unequal (and inferior) channel, and raises the question of whether efforts should be made to reintegrate educational and training programs for all youth into local systems that draw upon community support and orient themselves toward job opportunities that are available.

The resources that the United States has devoted to federal training and employment programs in recent years also appear large when compared to European experience. Austria, for example, where youth unemployment has been virtually nonexistent, devoted only about one-tenth as large a fraction of its national output at the peak of their programs in the mid-1970s. A key element in many European countries is the absence of legal minimum wages. In Austria, for example, beginning wages for youth in apprenticeship jobs and entry-level positions are typically about one-fourth average production wages. For the United States' economy this would mean $1.75 per hour compared to the current federal minimum wage of $3.35.

The wage level is an extremely important element in the employment picture for youth, and one that often is given little attention in discussions of youth unemployment problems. Minimum wage requirements operate to divorce work experience and training, and the effects of artificially forcing this separation are most serious for those youth who have not fared well in a pure education and training environment. Survey information shows that average wages for high school youth are below the federal minimum wage, and that wages students would accept are below their actual wages. The implication is that wages paid under federal programs at minimum wage levels are relatively high-paying jobs for many youth.

Proponents of CETA programs for youth often have defended them by arguing that they are a good investment in economic terms. The Job Corps is frequently viewed as the flagship of the fleet of federal programs, and a benefit-cost ratio of 1.4 is frequently cited for this program. Those who cite this figure often fail to note the special characteristics of this measure, in particular that it represents a "social" benefit-cost measure in which transfer payments made to program participants are not counted. Many of the recent studies evaluating training and employment programs are carefully done and utilize sophisticated estimation techniques. Questions could be raised about various aspects of these analyses, but I regard the combination of "double entry" bookkeeping and a three-column benefit-cost format as an approach with obvious potential for misinterpretation. In my view, these procedures lead to overstatement of realistic benefit-cost ratios, not only when the "social" measure is used but also when the ratio for nonparticipants in programs is used. In the Job Corps case, for example, the ratio for nonparticipants is about .9 (compared to 1.4 for the social ratio), and if the treatment of foregone earnings were shifted in addition, it would fall to something like .8.

As this discussion suggests, I believe there are legitimate questions about whether these programs are good investments in economic terms. I do not contend that programs of this sort should not be pursued unless a solid case can be made for them as strictly economic investments. However, I believe that we should have as clear an understanding as possible about the extent to which these programs can be justified in strictly economic terms in order to assess the extent to which we might otherwise wish to pursue them on other grounds.

In summary, I am concerned that in our efforts to improve job chances for disadvantaged youth, we have placed too much emphasis on federal programs that are separate elements in local institutional environments. The subsequent job experience of clients of these programs is apparently related to only a limited extent to the particular treatments that were applied. I believe that priority should be given to returning a large share of these responsibilities to local governments. In this process, emphasis should be placed on reintegrating school and work-training in ways that will serve the entire spectrum of needs in communities, and on building relationships with potential employers that can help to overcome the placement problems that have plagued federal programs. The form and content of special programs within the context of traditional educational institutions may also be influenced constructively by enlisting the interest of communities whose youth are served by the programs and of firms and institutions that draw upon these youth for their work force.

The Apprenticeship System of Job Training

ROBERT W. GLOVER

9

American Apprenticeship and Disadvantaged Youth

HISTORICAL OVERVIEW

Apprenticeship in one form or another has been a source of training for the skilled crafts literally for millennium. Four thousand years ago, the Babylonian Code of Hammurabi included provisions for artisans to teach their craft to youth.

The word "apprentice" derives its roots from the Latin word *apprendere,* which means "to comprehend" or "to learn." The system as we know it in America is a descendent of the medieval European craft guild system, through which a young person served under a skilled master to learn a craft. Then, as now, apprenticeship had specific entry requirements, as well as mechanisms for controlling wages and hours. Then, as now, the youth who completed their apprenticeships achieved journeyman status. They could travel from place to place, applying their craft, confident not only that they had sufficient skills and knowledge to do so, but also that they would be accepted as journeymen craft workers wherever they travelled.

The use of apprenticeship in America dates back to colonial times and often was associated with family traditions. Perhaps the two best known examples were Benjamin Franklin and Paul Revere. Benjamin Franklin was indentured to his elder brother James as a printer. Paul

Revere was a member of a famous family of silversmiths. Paul and his brothers learned the craft from their father, and two of Paul's sons served apprenticeships in the family business.

Modern apprenticeship has evolved considerably from these early roots; but to appreciate the system today, it is useful to know something of its past and the changes in the work place that have reshaped apprenticeship.

Prior to the Industrial Revolution, children were bound over by their parents to master craftsmen for varying lengths of time (often seven years or more) to be taught a trade. The contract was called an "indenture" after the English practice of tearing indentures or notches in duplicate copies of apprenticeship forms. The uneven edge identified the paper retained by the apprentice as a valid copy of the form retained by the master. The indenture, legally binding an apprentice to a master craftsman, outlined obligations for both parties. It usually called for the apprentice to be housed, fed, and clothed by the master during the training period and to work for the master in return for being taught the trade. Some agreements obligated the apprentice's parents to compensate the master for the apprentice's living expenses; others required the master to pay wages to the apprentice's parents in return for work performed by the apprentice. Whatever the details, the essence of the relationship between a craftsman and apprentice was much like that of a father and son. The apprentice lived with and worked for the master while learning the craft.

Apprenticeship served other purposes beyond occupational training. As Douglas notes, apprenticeship was preparation for life. Masters were usually required to give apprentices a basic education as well as manual training, and sometimes to compel church attendance as well (Douglas 1921, pp. 19-26).

Training, it seems, has long been viewed as a solution to poverty. The compulsory character of indentures made apprenticeship an appealing tool for attempting to prevent or alleviate poverty. Apprenticeship was used as a form of poor relief; paupers or the sons of the indigent could be apprenticed in order to prevent their becoming public burdens. This practice was legalized in the poor laws. In many cases, youngsters less than ten years old were involved. Since apprentices usually were bound to their masters until they were twenty-one years old, this often meant a term of ten or twelve years in apprenticeship. Likewise, apprenticeship was occasionally a transition period for freed slaves. In the United States and elsewhere, emancipated slaves sometimes were required to serve apprenticeships before they were permitted to enter free society. Finally, apprenticeship was used similarly as a punishment for debtors. Presumably by learning and practicing a craft, they would be able to earn sufficient income to keep them out of debt in the future.

The practice of indenturing was abused widely, especially in settling the New World. Under one common practice, workers paid off the cost of transportation to America by indenturing themselves as servants for a number of years. Often those indentured were former prisoners and their destination was a plantation in the southern states where labor was in high demand. Although those involved sometimes were called apprentices, this was a system of temporary slavery rather than training. No opportunity to learn a trade was provided, and the individuals who often profited most by it were ships' captains. Such exploitative practices eventually were made illegal; but they left a stigma on apprenticeship.

With the advent of the factory system in the nineteenth century, manufacturing production processes changed from handicraft to machine operations, and the apprenticeship system changed with it. Because factory owners obviously could not board all of their apprentices in their homes, they began to pay apprentices wages to purchase their own food and lodging. Essentially, the relationship between master and apprentice was no longer like that of father and son, but rather more like that of employer and employee.

Perhaps more serious was the fragmentation of the crafts under the factory system. Employers increasingly needed narrowly-skilled machine tenders rather than broadly-skilled craftsmen and soon began to use apprentices chiefly as operatives in place of journeymen. In manufacturing production work, apprenticeship became largely a source of cheap, unskilled child labor instead of a real training system. Apprenticeship today remains prominent only in handicraft trades requiring a high degree of skill, such as construction, metal working, and machinery repair. Perhaps more notable is that apprenticeship has survived at all through enormous changes in society and production. Apprenticeship has been a durable form of training; but to survive, it has had to adapt and evolve.

Historically, apprenticeship has remained a private contractual system of training. At its best, apprenticeship has been an important means of conveying skills from one generation to another. At worst, apprentices, through their indenture, have become vulnerable to exploitation of one form or another in the work place, including inadequate training, low exploitative wages, and terms of training beyond what was needed for learning. Given such a background, it is natural that public policy toward apprenticeship has on one hand promoted the use of the apprenticeship system and, on the other, aimed at promoting labor standards for apprentices.

Government Involvement in Apprenticeship

The twentieth century also brought government involvement in apprenticeship. In 1911, the state of Wisconsin enacted the first legislation in the United States to promote an organized system of apprenticeship. The law placed apprenticeship under an industrial commission because apprenticeship was viewed as industry training occurring mainly on the job, and the labor standards for apprentices were a key issue.

The same year, Wisconsin enacted a system of vocational education, in which apprentices were required to attend classroom instruction for five hours per week.

The first major action at the federal level was the Smith-Hughes Vocational Education Act of 1917 that provided partial reimbursement from federal funds for instructors of related training in apprenticeship.

With respect to the on-the-job portion of apprenticeship, the first federal involvement occurred in response to complaints about the effects of the National Industrial Recovery Act of 1933. The Act was intended to protect workers through the establishment of "codes of fair competition" for industry, which included minimum wages. However, industry complained that the minimum wages made hiring of apprentices unprofitable. Thus, the United States Secretary of Labor created the Federal Committee on Apprentice Training in 1934. Composed of representatives from the U.S. Department of Labor, the U.S. Office of Education, and the National Recovery Administration, the Committee oversaw a system to govern wage exemptions from the fair competition codes for apprentices. It also was responsible for preparing basic standards for use in developing apprenticeship programs. The Committee was able to establish state apprenticeship commissions in forty-four states, many of which later became state apprenticeship councils.

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In 1935, the National Industrial Recovery Act was ruled to be unconstitutional, but the Federal Committee on Apprenticeship Training was reorganized into the Federal Committee on Apprenticeship, an advisory body to the Secretary of Labor on national apprenticeship matters. Initial membership comprised representatives from management, labor, and the U.S. Office of Education. In 1937, the Committee became legally established as part of the National Apprenticeship Act, popularly known as the Fitzgerald Act.

The National Apprenticeship Act is a brief piece of legislation which has established the nation's basic policy toward apprenticeship for more than forty years. The Act authorizes and directs the Secretary of Labor to:

> Formulate and promote the furtherance of labor standards necessary to safeguard the welfare of apprentices, to extend the application of such standards by encouraging inclusion thereof in contracts of apprenticeship, to bring together employers and labor for the formulation of programs of apprenticeship, to cooperate with state agencies engaged in the formulation and promotion of standards of apprenticeship.

The Secretary also:

> may publish information relating to existing and proposed labor standards of apprenticeship, and may appoint national advisory committees to serve without compensation. Such committees shall include labor, educators, and officers of other executive departments.

Note that the Act requires only that the Secretary of Labor promote apprenticeship and labor standards for apprentices; the means by which the Secretary is to achieve these ends are not specified.

To carry out the functions of the Act, Secretary of Labor Frances Perkins established the Apprentice Training Service. In 1956, the agency was reorganized as the Bureau of Apprenticeship and Training (BAT).

As indicated in table 9-1, twenty-nine states, the District of Columbia, Puerto Rico, and the Virgin Islands have established apprenticeship agencies/councils.* In states without state apprenticeship agencies/councils, programs are registered with the BAT.

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*One other state, New Jersey, also has established a state apprenticeship agency, but it is not recognized by the U.S. Department of Labor because the New Jersey agency is not located in an agency with authority over labor standards.

TABLE 9-1

State and Territorial Apprenticeship Agencies/Councils Recognized by the U.S. Department of Labor

State or Territory	*Year Established*	*State or Territory*	*Year Established*
Wisconsin	1911	New York	1941
Oregon	1931	Washington	1941
Kentucky	1931	Maine	1943
California	1936	New Mexico	1945
Vermont	1936	District of Columbia	1946
Maryland	1937	Florida	1947
Colorado	1937	New Hampshire	1947
Virginia	1938	Puerto Rico	1947
Minnesota	1939	Utah	1948
Nevada	1939	Louisiana	1950
North Carolina	1939	Connecticut	1959
Arizona	1941	Ohio	1959
Hawaii*	1941	Pennsylvania	1961
Kansas	1941	Virgin Islands	1961
Massachusetts	1941	Delaware	1963
Montana*	1941	Rhode Island	1967

SOURCE: Lyndon B. Johnson School of Public Affairs 1980, p. 51.
*Has an agency but no advisory council.

Over time the role of state and federal apprenticeship agencies has developed to include the following:

- registering qualified apprenticeship programs,
- promoting the use of apprenticeship,
- developing and installing new apprenticeship programs,
- monitoring the operation of individual programs,
- providing technical assistance to apprenticeship program sponsors and ascertaining whether apprenticeship programs are in compliance with equal employment opportunity standards and other requirements for apprenticeship, and
- issuing certificates to completors of apprenticeship programs that meet standards.

Apprenticeship Standards

To be registered by the BAT or a state apprenticeship council, an apprenticeship program must meet the following basic standards:

1. Apprentices must be at least sixteen years old.
2. There must be full and fair opportunity to apply for admission into the program.
3. There must be a schedule of work processes in which apprentices are to receive training and work experience.
4. There must be related instruction or studies, customarily at least 144 hours per year.
5. There must be a progressively increasing schedule of wages for apprentices.
6. The employer must be able to provide proper supervision of apprentices; training, in adequate training facilities.
7. Apprentices' progress must be evaluated and recorded periodically.
8. There must be cooperation between employers and employees.
9. Successful completions must be recognized.
10. There must be no discrimination in selection, employment, or training.

GROWTH OF APPRENTICESHIP

Although apprentices comprise a relatively small proportion of all workers in the United States, the number of apprentices has been increasing steadily since the early 1960s. In fact, as shown in table 9-2, the number of apprentices in training has risen as rapidly as total employment or employment of craft and kindred workers—the segment of the labor force containing almost all apprentices. Thus, apprenticeship has maintained a steady position in relation to the size of the American work force over the past twenty years.

Available information on the distribution of apprenticeship across occupational categories is presented in table 9-3. Over the twenty-seven years for which data are available, there have been some interesting developments. Perhaps most notable has been the decline of apprenticeship in the printing trades. The application of the computer and other technological changes have virtually wiped out most of the craft jobs in the industry.

TABLE 9-2

Trends in Apprentices, Craft Workers, and Total Civilian Employment, United States, 1958-79

Year Jan 1	*Total Number of Apprentices*[a]	*Index (1958=100)*	*Craftsmen and Kindred Workers Employed (000)*	*Index (1958=100)*	*Total Civilian Employment (000)*	*Index (1958=100)*
1958	185,691	100.0	8,463	100.0	63,036	100.0
1959	177,695	95.7	8,554	101.1	64,630	102.5
1960	172,161	92.7	8,554	101.1	65,778	104.3
1961	161,128	86.8	8,617	101.8	65,746	104.3
1962	155,649	83.8	8,668	102.4	66,702	105.8
1963	158,887	85.6	8,915	105.3	67,762	197.5
1964	163,318	88.0	8,979	106.1	69,305	109.9
1965	170,533	91.8	9,216	108.9	71,088	112.8
1966	183,955	99.1	9,589	113.3	72,895	115.6
1967	207,511	111.8	9,845	116.3	74,372	118.0
1968	207,517	111.8	10,015	118.3	75,920	120.4
1969	237,996	128.2	10,193	120.4	77,902	123.6
1970	269,626	145.2	10,158	120.0	78,627	124.7
1971	278,451	150.0	10,178	120.3	79,120	125.5
1972	247,840	133.5	10,810	127.7	81,702	129.6
1973	243,956	131.4	11,288	133.4	84,409	133.9
1974	280,965	151.3	11,477	135.6	85,936	136.3
1975	284,562	153.2	10,972	129.6	84,783	134.5
1976	265,647	143.1	11,278	133.3	87,485	138.8
1977	253,993	136.8	11,881	140.4	90,546	143.6
1978	263,660	142.0	12,386	146.4	94,373	149.7
1979	284,591	153.3	12,880	152.2	96,945	153.8

SOURCE: U.S. Department of Labor 1980, tables F-14, A-15, and A-1.

[a] Number of registered apprentices at beginning of year.

TABLE 9-3

Occupational Distribution of Apprenticeship, United States, 1952-79

Year	*Total Number of Apprentices*	*Building Trades (percent)*	*Metal Working Trades (percent)*	*Printing Trades (percent)*	*Other Trades (percent)*
1952	172,477	45.2	8.5	5.8	40.5
1953	158,532	48.4	9.8	5.5	36.3
1954	160,258	51.2	11.9	6.0	30.9
1955	158,675	51.5	11.6	6.3	30.6
1956	174,722	57.7	11.7	8.1	22.5
1957	189,684	60.2	11.4	7.6	20.8
1958	185,691	59.7	11.0	7.7	21.6
1959	177,695	61.2	10.7	7.6	20.5
1960	172,161	62.0	14.5	7.4	16.1
1961	161,128	63.9	14.8	8.2	13.1
1962	155,649	64.7	14.3	8.2	12.8
1963	158,887	64.9	14.8	8.0	12.3
1964	163,318	65.5	15.2	7.4	11.9
1965	170,533	64.4	16.4	6.7	12.5
1966	183,955	62.5	18.5	6.4	12.6
1967	207,511	58.9	21.6	6.0	13.5
1968[a]	207,517	55.5	22.9	5.4	16.2
1969	237,995	55.7	23.7	5.4	15.2
1970	269,626	56.5	21.3	5.1	17.1
1971	278,451	49.4	14.4[a]	3.9	32.3
1972	247,840	55.9	13.7	4.5	25.9
1973[a]	243,956	64.9	9.6	4.0	22.4
1974	280,965	63.8	9.9	3.6	22.7
1975	284,562	63.8	10.7	2.9	22.6
1976	265,647	62.2	11.1	2.5	24.2
1977	253,993	60.1	11.9	2.2	25.7
1978	263,660	60.1	12.1	2.0	25.8
1979	284,591				

SOURCE: U.S. Department of Labor 1981, table F-13.

[a] Revision in reporting system introduced.

A second phenomenon has been the growth and decline of the relative share of apprenticeship in metal working jobs. Rather than training all-round machinists and tool and die makers, employers have moved to employ specialists—machine operators with a much narrower range of skills. Finally, the largest sector, construction, dipped in importance in the late 1960s but has accounted for more than 60 percent of all apprentices since 1973. Caution should be used in interpreting these data, however, because there have been major changes in the reporting system over time that make the time series less than perfectly continuous over the period.

Participation of Minorities and Women in Apprenticeship

Beginning in the 1960s, construction unions were confronted by the black community and the federal government because many of them had few or no black members. Beginning in the 1960s, several efforts of the federal government were directed at increasing minority admissions into building trades unions. These included administrative remedies such as affirmative action regulations applied to contractors who do business with the federal government and regulations to promote equal opportunity in apprenticeship (29 CFR 30), legal remedies such as court actions, and support for various types of locally imposed or negotiated affirmative action plans for employing minorities in construction. As a key entry point for several craft occupations, apprenticeship is an appropriate point to bring to bear affirmative action pressures.

In addition to action to pressure the building trades to remedy their problems of underrepresentation of blacks, programmatic efforts were funded to assist the industry to comply with their affirmative action mandates. These included apprenticeship information centers, apprenticeship outreach programs (later called targeted outreach programs), various types of preapprenticeship, trainee programs, and on-the-job training.

In part as a result of these efforts, minorities have made significant gains in construction apprenticeships since 1960, when, nationwide, only an estimated 2.2 percent of construction apprentices were minorities (Marshall and Briggs 1967, p. 28). Minorities comprised 7.2 percent of construction apprentices at the end of 1968, 15.1 percent at the end of 1972, and over 18 percent at the end of 1979. The racial composition of construction union membership has changed more slowly, however. Further, minority concentration varies significantly by trade as shown in table 9-4.

TABLE 9-4

Registered Apprentices by Trade, As of December 31, 1978, in the United States

	Total	*Percentage Minority*	*Percentage Female*
Total Apprentices — All Trades	290,224	17.7	3.1
Building Trades	175,303	19.3	1.9
Bricklayer, stone and tile setters	8,423	22.6	1.0
Carpenters	43,174	18.1	2.4
Cement masons	3,129	47.5	2.9
Electricians	34,486	15.1	1.9
Floor coverers	1,705	22.3	0.5
Glaziers	1,155	18.2	0.2
Insulation workers	99	22.2	1.0
Lathers	1,408	26.5	0.6
Line erectors, light and power	4,667	12.0	2.2
Operating engineers	5,431	32.3	4.2
Painters	1,711	25.1	5.1
Pipefitters, sprinkler fitters, steamfitters	16,417	15.8	1.9
Plasterers	492	39.9	1.9
Plumbers	2,571	14.6	0.7
Roofers	1,775	36.6	0.8
Sheet metal workers	2,103	18.8	1.4
Structural steelworkers, ornamental ironworkers	8,413	20.6	0.8
Taper, dry-wall applicators	1,770	24.5	3.7
Construction workers, NEC	2,701	22.4	2.0
Metal Working Trades	33,783	10.1	2.5
Boilermakers	487	12.8	0.9
Machine set-up and operators	1,265	20.4	2.5
Machinists	15,690	12.2	2.7
Toolmakers, die makers	13,038	7.3	2.8
Service and Repair Trades	30,021	16.9	2.2
Air-conditioning and refrigerator mechanics	1,992	17.5	1.1
Aircraft mechanics and repairers	642	10.7	9.2
Automotive and related mechanics	9,905	20.7	0.8
Automotive and related body repairers	3,183	17.7	1.9
Car repairers (railroads)	3,136	16.7	3.1
Maintenance mechanics	4,732	13.2	4.8
Office machine services	1,133	15.4	2.1
Radio, TV repairers	678	14.0	1.5
Mechanics and repairers, NEC	4,620	13.5	1.9

(continued)

TABLE 9-4, continued

Registered Apprentices by Trade, As of December 31, 1978, in the United States

(continued)	*Total*	*Percentage Minority*	*Percentage Female*
Personal Services Trades	8,413	21.2	19.2
Barbers, beauticians	1,360	19.2	60.5
Butchers, meat cutters	2,272	23.5	8.5
Cooks, bakers	2,522	26.2	15.8
Medical and dental technicians	1,834	14.8	8.5
Optical workers	425	12.2	13.4
Graphic Arts Trades	5,375	16.7	5.2
Bookbinders	681	18.4	10.6
Compositors	425	11.1	13.2
Lithographers, photoengravers	2,336	16.2	3.4
Press operators	1,071	21.8	2.3
Printing and publishing workers, NEC	862	13.5	5.7
Miscellaneous Trades	37,329	16.7	5.7
Cabinetmakers, wood machinists	1,986	22.2	3.4
Drafters, designers	789	11.9	9.4
Electrical workers, NEC	1,024	15.8	3.4
Electronic technicians	1,562	14.7	13.8
Industrial technicians, NEC	1,365	25.4	11.6
Millwrights	5,709	14.1	2.0
Molders, coremakers	642	18.2	2.5
Patternmakers	982	5.5	1.7
Stationary engineers	1,962	19.0	2.5
Miscellaneous trades, NEC	21,308	16.9	6.4

SOURCE: U.S. Department of Labor 1981b.

NOTE: Characteristics data are not available for all apprentices. More specifically, characteristics data are not available for 8,926 apprentices or 3 percent of the total. Thus, percentages for participation of minorities and females are minimum figures.

NEC = Not elsewhere classified

Although the situation in the construction industry initially prompted action, many of the affirmative action pressures as well as many of the assisting programs have been directed at apprenticeship generally. And although there is some variation by trade, on the whole, much progress has been made by programs outside of construction as well.

Underrepresentation of women in apprenticeship has been a separate problem. With the sole exception of cosmetology, apprenticeship is concentrated in jobs traditionally held by men. Thus, it became a target for women's activists during the 1970s. In 1978, under pressure from a court suit, the U.S. Department of Labor applied affirmative action goals and timetables to bring women into apprenticeship. According to these goals, approximately 20 percent of all new apprentices were to be women. Various outreach groups also increased recruiting activities for women in apprenticeship. In 1973, only 0.8 percent of all newly indentured apprentices were women. Five years later, the figure was 4.3 percent. A March 1981 survey made by the Bureau of Apprenticeship found female participation to be a little more than 5 percent. Further, the 16,722 women were well distributed across apprenticeship trades. Progress has been made, but there is a long way to go, and simply getting women to enter apprenticeships may not be sufficient to integrate the skilled crafts. Some individuals have expressed concern that once in apprenticeship, women may have higher attrition rates than men. Clear evidence on retention and attrition by race and sex is unavailable at this time. However, a study of the subject by CSR, Incorporated, a Washington, D.C. consulting firm, was begun in 1981 under funding from the U.S. Department of Labor.

SOCIOECONOMIC STATUS

Because the wages of most apprentices are well above the minimum wage, unless a substantial period of unemployment strikes, it is doubtful that many apprentices qualify as disadvantaged once in the program. As will be noted later, this earning while learning feature of apprenticeship is one of its most attractive aspects.

Information on the socioeconomic background of *entrants* to apprenticeship is not collected. However, it is unlikely that many disadvantaged individuals enter the most established apprenticeship programs without some special preparation efforts. This is because the competition for apprenticeship positions in these programs is quite keen, with as many as twenty applicants for each available job. Secondly, as apprenticeship sponsors are quick to point out, working in many of the more technical apprenticeable occupations such as the electro-mechanical trades in construction, some metal working trades, and some high-technology jobs, requires significant learning abilities as well as a background in mathematics.

The ability levels required for apprenticeship entry can be achieved by disadvantaged individuals through special preemployment preparation. As the administrative records of certain programs document, disadvantaged individuals, given certain remedial and preparatory assistance, can compete successfully for apprenticeship positions. One good example is from Targeted Outreach Programs (formerly called Apprenticeship Outreach Programs), which have had as one of their primary objectives the placement of women and minorities into apprenticeship. One program aimed exclusively at apprenticeship placements reported that in FY1980, 50 percent of all those entering employment were disadvantaged.*

In summary, although data are sketchy, it seems likely that few disadvantaged individuals have gained an apprenticeship position in this country without special assistance (also see next chapter). Perhaps more important, various programs such as Targeted Outreach and the Job Corps have demonstrated that individuals *can* prepare for successful entry into apprenticeship.

AGE OF APPRENTICES

Information on the age of apprentices is difficult to obtain because it is not collected nationally as a part of any regular series. California does compile information on age. Table 9-5 displays the distribution among age categories for all apprentices as well as for minority apprentices in California. Overall, only one in five starting apprentices in 1980 was a teenager. Among minorities only one in six starting apprentices was a teenager. Further, a review of the past five years in California shows "that the general entry age has increased slightly over the years." Whereas 66.2 percent of starting apprentices were under twenty-five in 1980, only 62.3 percent were in 1975.

An analysis of 137 minority apprentice placements in sheet metal work, electrical work, and plumbing made by the Recruitment and Training Program (RTP) in Brooklyn during selected years from 1968 to 1975 revealed an average age of 23.1 years (Green 1976, p. 209).

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*Operated under the cosponsorship of the Human Resources Development Institute (HRDI) and local Building Trades Councils, this Targeted Outreach Program makes most of its placements in apprenticeship programs jointly sponsored by employers and unions. The data cited here apply to all placements made by HRDI under the TOP program, however, because reporting procedures did not call for placements in apprenticeship to be reported separately.

TABLE 9-5

Age at Entry of Registered Apprentices in California: 1976-1980

Age of entry	*All ethnic groups (percentage of total)*					*Minorities (percentage of total)*				
	1976	*1977*	*1978*	*1979*	*1980*	*1976*	*1977*	*1978*	*1979*	*1980*
16-19 years	18.6	19.0	19.3	19.7	19.1	16.3	16.5	17.2	17.5	16.7
20-24 years	47.6	46.2	44.8	43.9	43.2	45.3	43.5	42.4	41.6	40.5
25-29 years	25.0	25.1	24.3	23.5	23.7	26.3	27.2	26.2	25.7	26.0
30-34 years	5.7	6.5	7.4	8.1	8.9	7.9	8.4	9.3	9.7	10.7
35-39 years	1.8	1.8	2.3	2.8	2.9	2.6	2.6	2.9	3.4	3.7
40 years or older	1.3	1.4	1.9	2.0	2.2	1.6	1.8	2.0	2.1	2.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total Apprentices	29,930	34,393	41,615	46,156	45,614	8,443	10,094	12,356	13,562	14,003

SOURCE: California Department of Industrial Relations, Division of Apprenticeship Standards 1981, p. 2.

The age of American apprentices contrasts sharply with that of apprentices in other countries. In fact, in every country except the United States and Canada, apprenticeship is a teenage youth program (Reubens 1980, p. 10). In several European countries, the maximum age for apprentices is set at twenty years of age.

What accounts for this significant difference? First, in most countries, apprenticeship is the equivalent of the last two or three years of formal secondary education, whereas in the United States, apprenticeship is generally considered to be advanced training beyond high school. Second, in many manufacturing plants, apprenticeship slots are eagerly competed for because they offer production workers a route to craftwork. Apprenticeship positions thus often are reserved for existing workers and allocated on the basis of seniority. Sometimes, seven or eight years of seniority are required to bid successfully for apprenticeships. Even in apprenticeship programs with direct admission, such as the building trades, sponsors consider apprenticeship to be an expensive investment and thus reserve it for individuals they judge to be mature, stable, and likely to remain with the trade.

Finally, many apprenticeship sponsors give preference to veterans, and because the GI Bill can be used with apprenticeship programs, many veterans are attracted to apprenticeship. Veteran status may add three or four years to the age of a starting apprentice.

Although some may lament the fact, the trends in the United States are against using apprenticeship as a program for teenage youth. For example, age discrimination legislation in eleven states and some court decisions have caused apprenticeship sponsors to drop their maximum age requirements for apprenticeship entry. Further, women's groups point out that many suitable female candidates are likely to come to a decision to enter traditionally male trades at an older age.

At the same time, the Equal Employment Opportunity Commission (EEOC) in a two-to-one vote in August 1981 has agreed to continue the traditional exemption of apprentice training programs from coverage under the Age Discrimination in Employment Act. The decision was rendered "in recognition of the fact that apprenticeship is an extension of the educational process to prepare young men and women for skilled employment" (Title 29, CFR Part 1625.13 "Interpretations: Age Discrimination in Employment Act").

FEATURES OF AMERICAN APPRENTICESHIP TODAY

American apprenticeship is a highly diverse and largely decentralized institution. Thus, any candid attempt to describe apprenticeship must start with a warning, namely: there is as much variation among apprenticeship programs as there is among programs of public vocational education. Each apprenticeship program has its own jurisdictional area, selection methods and criteria, starting wages, techniques of job dispatching, credit provisions for prior education or experience, and so on. The quality of training offered through apprenticeship also varies considerably by trade and place. Moreover, some programs attract as many as twenty applicants for each available position, whereas others have difficulty finding sufficient numbers of qualified candidates. Some programs show high dropout rates, whereas others are known for their exceptionally high rates of completion. However, a few common features of all American apprenticeship programs can be identified.

COMMON FEATURES OF APPRENTICESHIP

Perhaps the most sensible way to begin is to define the term "apprenticeship." Beatrice Reubens, in a review of apprenticeship practices in several nations, concludes that:

> Apprentices are those who participate in an industry-based initial training system under a contractual employment relationship in which the firm promises to make available a broad and structured practical and theoretical training of some length in a recognized occupational skill category. Completion of the apprenticeship establishes skilled worker status and transferable qualifications, although it may not be the only route to skilled employment. (Reubens 1980, p. 7)

Apprenticeship is one form of alternating work-study training schemes. Two other examples of common work-study schemes are cooperative education, and clinical education such as that used in medical occupations. There are at least five features that distinguish apprenticeship from the other forms of work-study arrangements:

1. Apprenticeship is conducted in occupations recognized as apprenticeable.
2. Apprenticeships are jobs rather than just training positions. For their work, apprentices are paid according to a graduated wage scale, which increases throughout the apprenticeship.

3. Most of the time in training is spent on the job.
4. Apprenticeship is industry based rather than school based.
5. Apprenticeship aims at training for the industry rather than for a single employer.

Let us review each of these features in turn.

Occupations Deemed Apprenticeable

Apprenticeship training is conducted in an occupation recognized as "apprenticeable" by the Bureau of Apprenticeship and Training of the Employment and Training Administration, U.S. Department of Labor, or one of thirty-two other apprenticeship agencies in the states and territories that can interpret the federal criteria for apprenticeability.

According to U.S. Department of Labor regulations, an apprenticeable occupation is a skilled trade that possesses all of the following characteristics:

1. It is customarily learned in a practical way through a structured, systematic program of on-the-job supervised training.
2. It is clearly identified and commonly recognized throughout an industry.
3. It involves manual, mechanical, or technical skills and knowledge that require a minimum of 2,000 hours of on-the-job work experience.
4. It requires related instruction to supplement the on-the-job training.

(*Federal Register* 45, no. 34 (18 February 1977): 10141)

As one can see, these criteria are quite broad. Indeed, these 1977 criteria represented a substantial broadening of the definition of apprenticeship previously used. The former definition included specific prohibitions against the use of apprenticeship in clinical and managerial occupations as well as retail sales. Further, it allowed apprenticeship only in occupations requiring manual skills. Finally, it contained a provision indicating that a trade that was part of another apprenticeable craft would not be apprenticeable in itself.

The issues of what occupations are apprenticeable and how apprenticeability is determined are matters of some confusion, controversy, and disagreement. Officially, the Bureau of Apprenticeship and Training

(BAT) recognizes approximately 450 occupations as apprenticeable. However, in March 1980 a consolidated list compiled to show the occupations recognized as apprenticeable by the BAT or by state apprenticeship agencies revealed 723 occupational titles. The occupations ranged from accordian maker to x-ray equipment tester. Since the publication of the list, approximately a dozen more occupations have been added.

In practice, it makes little difference what occupations are apprenticeable since apprenticeship training is concentrated within a few occupations and industries. Among the March 1980 list of 723 occupations deemed apprenticeable, not a single apprentice nationwide was registered in approximately half of these occupations. Indeed, only ten occupations accounted for more than 60 percent of all the 290,224 apprentices registered as of the end of 1978. These were carpenter, electrician, plumber, pipefitter, machinist, tool and die maker, sheet metal worker, automotive and related mechanic, bricklayer, and structural steelworker. Of these ten, seven were building trades. Apprenticeship institutions—such as joint sponsorship by a group of employers and a union and the apprenticeship trust fund concept—are especially suitable to unionized construction labor markets. The construction industry has been a major user of apprenticeship in the United States, and in turn, apprenticeship has been influenced significantly by construction industry perspectives. Thus, in order to understand American apprenticeship, it is essential to have some knowledge of the construction industry and construction labor markets.

A second area of concentration is among metal workers and craft workers in the maintenance departments of large-scale manufacturing firms. Such firms suffer little turnover among their employees and do not fear losing workers, once trained. Also, their operations are so large that they can enjoy economies of scale in establishing training workshops.

Apprenticeships as Jobs

An apprenticeship is a *regular* job—not just a training position. Apprentices are paid progressively increasing wages according to a predetermined agreement, and assuming they perform satisfactorily, apprentices will be retained beyond the duration of apprenticeship. In fact, since employers often consider apprenticeship training an expensive investment, it is in their interest to keep apprentices after training. An important point here is that since apprenticeships are jobs, the number of positions available is limited by *present* labor market conditions even though future labor market conditions ideally should be considered in determining the number of craft workers to be trained.

As jobs, apprenticeships offer a special opportunity of earning while learning. This reduces the opportunity cost of training and makes skill training affordable to those who might not otherwise be able to consider it. This feature also lengthens the term of apprenticeship since apprentices are involved in regular production work rather than only in concentrated training.

The Balance between Classroom and On-the-Job Training

The bulk of the time in apprenticeship is spent learning on the job rather than in school. Federal apprenticeship regulations specify that apprenticeships should involve a minimum of 2,000 hours of on-the-job work experience, whereas a minimum of only 144 hours per year is required for related training. In practice, most American apprenticeships run about four years, and apprentices spend less than one hour in the classroom for every ten spent on the job.

Apprenticeship as Industry-based Training

Apprenticeship in the United States remains primarily a private institution almost entirely privately sponsored and funded. Further, the apprenticeship sponsors are quite committed to retaining the essentially private character of the system, and they are highly resistant to any effort that they view as government intervention. Partly because of this suspicion of public sector involvement and partly as a result of the failure of public schools to understand apprenticeship and reach out to industry in the past, meaningful alliances between vocational-technical schools and apprenticeship programs are sensitive and difficult to build, despite the fact that related classroom instruction often is provided to apprentices by local school systems or community colleges.

Apprenticeship is *industry based* rather than school based. In practice this means that industry generally has primary influence over decisions regarding training. Key areas of concern to industry include the following:

1. The number of applicants admitted to training, what their qualifications should be, and selection of those to be trained

2. The length, coverage, and organization of the curriculum
3. The qualifications of the instructors and determination of who should teach
4. Determination of progress (and thus wage rates) through the apprenticeship
5. The design of the training facilities
6. The equipment used in training

There are several advantages to leaving such decisions regarding the training program to industry officials. First, the training is likely to be more job relevant and will be more likely to keep pace with technological changes in the job. Second, the training is more likely to be geared to the labor market in that those who complete the program have greater assurance of continued employment.

On the other hand, there are potential shortcomings to industry decision-making in these matters. For example, left unchecked, an individual employer may train the individual narrowly and specifically to fit the needs of his or her firm so that few transferable skills are taught. Apprenticeship provides an important counterbalance to these tendencies since, by design, it is aimed at producing broad and transferable skills applicable across industry. Another shortcoming is that due to adverse economic conditions in the present or to lack of accurate long-range forecasting, conservative outlook, or general reluctance to invest in training, industry may undertrain for a given occupation. Thus, although those who do complete apprenticeship have high assurance of obtaining and maintaining continued employment related to their training, there often are too few trained to meet full labor market needs.

Training for the Industry Rather than for Individual Firms

We already have noted that to be recognized as apprenticeable, an occupation must be commonly recognized throughout an industry. Wherever possible, apprenticeship agencies attempt to work with the industry as a whole or at least to help design training programs on the basis of training standards that were developed industry-wide.

This is an important feature of apprenticeship because it helps ensure that apprentices will be offered broad training rather than training that is specific to an individual firm. In a sense, this provision guarantees transferability and portability of a journeyworker's skills.

SPONSORS OF APPRENTICESHIP

Although there are a few governmental employers who sponsor apprenticeship programs, these are exceptions. Apprenticeship is not inappropriate to training public workers; it is just little used in the public sector. Thus, apprenticeship is sponsored mainly by private enterprise. Of the 50,704 programs reported registered with governmental apprenticeship agencies in June 1979, 85 percent were sponsored unilaterally by single employers, fewer than 1 percent were sponsored unilaterally by groups of employers, and 14.4 percent were sponsored jointly by a union together with a single employer or a group of employers. No apprenticeship programs were sponsored solely by a union. The jointly sponsored programs were the largest, accounting for more than two out of three apprentices registered at the time.

THE FINANCING OF APPRENTICESHIP

Although financing of apprenticeship training varies considerably by trade and place, the costs are borne by some combination of funding from the apprenticeship sponsor, contributions from the individual apprentice, and public funding from vocational education (in connection with the related training portion of apprenticeship).

Data on apprenticeship expenditures are not available, but it is fair to say that most of the costs of the system are borne by apprenticeship sponsors. Certainly any costs of the on-the-job portion of apprenticeship such as supervision and breakage are paid for by the employer. Apprenticeship sponsors also may contribute substantially to the costs of related training. They may provide the facilities or at least the equipment on which training is conducted. They also may pay the salary of an apprenticeship coordinator as well as salary supplements to apprentice instructors.

Funding for apprenticeship programs sponsored by a group of employers often is raised through the establishment of a training trust fund. The first such fund was developed in Tulsa, Oklahoma, during the 1950s, and the idea caught on rapidly among programs jointly sponsored by unions and employers. They could raise funds through the collective bargaining agreement. For example, a few cents per hour worked for each worker in the trade could be contributed to this fund by the employer. Some groups of nonunion employers have established training trust funds as well, but this is rare because many employers will not voluntarily tax themselves to pay for training.

The apprenticeship trust funds usually are established in a local jurisdiction; but four trades have established national apprenticeship trust funds to undertake such functions as developing curriculum, sponsoring apprentice contests, and developing and conducting teacher training for apprentice instructors who teach in related training. In addition, the National Training Fund of the Sheet Metal Industry assists local programs in gaining access to equipment needed for training. It sponsors mobile vans full of welding equipment. These vans drive from locality to locality especially in the smaller towns and rural areas that do not have sufficient equipment. The National Training Fund also operates a loan-grant program to assist local sponsors in purchasing their own equipment.

In terms of out-of-pocket expenditures, the cost of training to apprentices is generally quite minor. Apprentices may pay a tuition charge for attending related training in a public vocational school, and they may have to pay for their books and study materials. Conceivably, apprentices themselves could contribute to the costs of apprenticeship if their wages are below their productivity value. But such a differential would give apprentices incentive to move to employers who pay wages more commensurate with productivity. At any rate, comparing wages with productivity of apprentices is a most difficult calculation to make since data are not available.

Public funding for apprenticeship is confined to the related training portion of apprenticeship. Most commonly, public vocational monies will pay the basic salary of the apprentice instructor for conducting related studies. In some states, public funds also may be used to train prospective apprentice instructors in how to teach. Public vocational facilities also are used for related training by many apprenticeship sponsors.

Data on the amount of public funding devoted to apprenticeship nationwide are not available. Information occasionally is available at the state level. For example, in Texas approximately 12,000 of the 17,000 or so registered apprentices in Texas were receiving some form of assistance in related training during FY 1980. Texas Education Agency records show a total of $4.69 million spent for apprentices, a figure that would amount to just less than $400 per apprentice per year.

THE NATURE OF TRAINING IN APPRENTICESHIP: EMPHASIS ON SKILL DEVELOPMENT

The key emphasis in apprenticeship is placed on developing psychomotor skills and obtaining related knowledge (cognitive skills).

The first step in developing an apprenticeship program is to decide on the work processes or major operations in the occupation to be learned. The best means of accomplishing this is to conduct a complete job analysis. Next an estimate of the work time needed to train in each process is developed. Here, schedules of recommended work processes developed in national standards often are helpful in making determinations.

When completed, the schedule of work processes and time allocated becomes a rotation schedule for apprentices through their apprenticeship.

For the related training portion of apprenticeship, a program of study (to be a minimum of 144 hours per year) is developed. Instructional materials for related study may be specially developed by the industry, purchased from commercial publishers, or developed through a curriculum development unit operated by vocational agencies in a selected state (not all states develop instructional materials).

Traditionally, instruction has been conducted in a group lecture situation. However, many of the smaller programs with apprentices of all levels in the same classroom have had to develop individualized instructional techniques. Apprentices in isolated rural areas sometimes receive their related study through correspondence courses and meet with an instructor occasionally for consultation and testing. Another method used to serve rural apprentices in some states has been the use of itinerant instructors or "circuit riders."

There is a trend in apprenticeship away from time-based modes of training and toward competency-based or performance-based training. One notable example of this is the Performance Evaluated Training System (PETS) used for training carpenters. This system is completely individualized with a heavy emphasis on manipulative training. Rather than sit in a classroom, carpenter apprentices build a series of projects after watching an individualized slide presentation (without sound) on how to complete each project. The instructor rotates among the apprentices to answer their questions and judge their work. This sort of program often takes up a lot of room, requires dirt floors, and high ceilings—not often found in public school facilities. Thus, many carpenters' programs have begun to develop their own facilities.

There are easily more than 1,000 private training facilities funded and operated by local group apprenticeship programs in the United States. Some of these facilities, especially those located in larger urban areas, are excellent and well equipped. They generally are used only for the related training portion of the apprenticeship program involved. Although programs with their own facilities comprise only 2 percent of all apprenticeship programs, they include an estimated 30 percent of all apprentices.

Many of the 50,000 local apprenticeship programs conduct related training in a local public vocational facility of some kind, either at the secondary level or the postsecondary level. What proportion of related training is conducted at postsecondary institutions is unknown, but trends are definitely toward the involvement of postsecondary institutions. More apprenticeship programs are beginning to offer the opportunity for an associate-level college degree in conjunction with their apprenticeship programs.

DEVELOPING GOOD WORK HABITS AND ATTITUDES

Whereas the primary emphasis in apprenticeship is devoted to skill building, development of work habits is an important by-product. Completing an apprenticeship program takes a good measure of discipline. Since related training often is conducted at night after work, this means that apprentices must come to an evening two-hour training session twice a week (generally on their own time) after working an eight-hour day, over the period of the apprenticeship, which commonly lasts four years. Many of the larger apprenticeship program sponsors have extremely tough policies on absenteeism from related training. Thus, apprentices in manufacturing, for example, find that they may have to work night shift or swing shift or move their work hours around to attend related training.

There also is a socialization process that goes on in apprenticeship. There is a certain fraternal character to it, and through it, sponsors often try to develop such attitudes as pride in craftsmanship. Competitive zeal often is exhibited in national contests that are held in several of the major apprenticeable trades.

There are certain initiation rites for apprentices (such as carrying the journeyman's tool box or going for the coffee), which if successfully negotiated probably help to socialize individuals into accepting supervision better.

Also, in many programs, apprentices are regularly reminded of the heavy investment the sponsor is making in them. They also may be aware of the fact that they were chosen from a long line of applicants for the job.

CRITICISMS OF APPRENTICESHIP

Apprenticeship probably has more than its share of critics. Let us briefly review some of the arguments set forth in at least three categories.

Inadequate Numbers Trained

Probably the most persistent criticism of apprenticeship is the small number of completions it produces relative to expected added demand and replacement needs in the trades. Although industry officials promote apprenticeship as the best mechanism for training young people in the trades, apprenticeship produces a majority of craft workers in only a few recognized construction trades.

In defense of apprenticeship, some argue that its role is not to fill the entire demand but rather to provide a core of broadly trained key journeymen, foremen, and supervisors. In this sense it can be viewed as a management training device rather than a means of training the entire work force. Yet most apprenticeship programs are avowedly not supervisory training. Although sponsors acknowledge that the broad training available through apprenticeship produces good candidates for supervisory positions, management training should occur after apprenticeship. Some employers argue that apprenticeship overtrains the standard journeyman. Responding to this argument quickly leads to a debate over the advantages and disadvantages of broad versus narrow training.

But even if one ignores the philosophical issues about the role of apprenticeship and asserts that apprenticeship should be aimed at filling all replacement and new demand needs in apprenticeable occupations, the issue of numerical adequacy of apprenticeship is a difficult technical question confounded by lack of appropriate data.

Table 9-6 compares the number of apprenticeship completions with the annual change in employment for craft workers and kindred workers. As noted, the average number of apprenticeship completions amounted to 19 percent of the mean average annual increase in craft workers and kindred workers over the decade of the 1970s. It should be emphasized, however, that these data are only rough and ready indicators for several reasons. Although almost all of the more active apprenticeship programs are in craft occupations, there is not an exact match between the categories "apprenticeable" and "craft and kindred." Secondly, the completion data count only those in programs that are registered with governmental apprenticeship agencies. Completions from unregistered programs may amount to anywhere from a third to half as many additional completions. Finally, as several industry officials point out, many of those who complete only part of an apprenticeship nevertheless end up working at the trade with journeyman status anyway.

All of these factors mean that the data may understate the importance of apprenticeship as a source of training for craft occupations; but on the other hand, not counted was replacement of workers in the work force in 1969 who died, retired, or changed occupations over the decade. If openings due to replacement equalled job demands due to expansion, then apprenticeship accounted for in the neighborhood of 9 to 10 percent of all craft workers required during the decade. Certainly overall, apprenticeship accounted for a small but meaningful portion of the new craft workers added to payrolls during the 1970s.

Table 9-6 illustrates, however, the fluctuation in the employment of craft workers. In two of the ten years, employment of craft workers declines. Such erratic labor market performance is especially characteristic of the construction industry. This instability causes uncertainty, which makes apprenticeship sponsors conservative in forecasting future needs for skilled workers and thus in determining the number of apprenticeship positions to be offered.

Of course, to be more precise, data on numerical adequacy have to be disaggregated by trade. Further in the construction industry, particu-

TABLE 9-6

Apprenticeship Completions Compared with Annual Changes in Employment for Craftsmen and Kindred Workers

	Change in Craftsmen and Kindred Workers Employed From Previous Year	*Completions in Registered Apprenticeships*	*Completions as a Percentage of Annual Increases in Craftsmen and Kindred Workers Employed*
1970	-35,000	53,610	—
1971	20,000	43,104	216%
1972	632,000	56,750	9%
1973	478,000	49,860	10%
1974	189,000	56,292	30%
1975	-505,000	55,338	—
1976	306,000	49,650	16%
1977	603,000	44,975	7%
1978	505,000	54,111	11%
1979	494,000	43,454	9%
Annual Averages (1969-1979)	268,700	50,714	19%

SOURCE: U.S. Department of Labor 1981a, tables A-15 and F-13.

larly, information should be sorted out for the union sector and the nonunion sector separately.

Table 9-7 attempts to compare journeyman/apprenticeship ratios for various trades. One point the table makes clearly is that allowable journeyman/apprentice ratios in union collective bargaining agreements do not control the number of apprentices hired. Employers consistently hire fewer apprentices than they are entitled to under the journeyman/apprentice ratios. Second, performance varies significantly by trade with the electricians, plumbers/pipefitters, and sheet metal workers training a higher proportion of apprentices relative to journeymen than other trades. It should be pointed out that these data apply to the union sector. Nonunion employers are far less prone to offer apprenticeship training, especially in the construction trades.

TABLE 9-7

Journeyman/Apprentice Ratios for Selected Occupations

Occupation	*Allowable Journeyman/ Apprentice Ratio*	*Estimated Ratio of Total Active Journeymen to Apprentices, 1979* [a]	*Estimated Journeyman/Apprentice Ratios, Selected States*		
			West Virginia [b] *(1974-75)*	*Indiana* [b] *(1974-75)*	*Wisconsin* [c] *(1965)*
Construction:					
Air conditioning/ refrigeration mechanics	5:1		15:1	7:1	—
Bricklayers	5:1	12:1	18:1	11:1	15:1 [d]
Carpenters	5:1	13:1	56:1	29:1	16:1
Electricians	3:1	6.5:1	16:1	9:1	6:1
Plumbers/pipefitters	5:1	8:1	11:1	8:1	8:1 [e] 6:1 [f]
Sheet metal workers	4:1	4:1	13:1	8:1	7:1
Structural ironworkers	5:1	—	17:1	19:1	—
Nonconstruction:					
Auto and related mechanics	5:1		9:1	8:1	—
Machinists	5:1	10:1 [g]	6:1	8:1	
Tool and die makers	5:1		15:1	9:1	—

[a] Estimates from union membership data.

[b] Swerdloff 1978, table 4: OES survey data, p. 42.

[c] Magrusen 1967, table 10: primary survey data, p. 78.

[d] Bricklayers and other trowel trades.

[e] Plumbers only.

[f] Steamfitters only.

[g] Ratio for all three machinist trades.

There are some indications of a long-run trend toward a greater reliance on apprenticeship in union construction. For example, a University of Texas study of 1,234 union journeymen in six trades determined that of those who entered the union prior to 1950, 36 percent came through apprenticeship. For union entrants during 1960 through 1972, 52 percent came through apprenticeship (Glover 1975, pp. 65-66). For some trades, the increasing use of apprenticeship was even more pronounced. For example, among sheet metal workers, only 20 percent of journeymen in the sample who entered the union before 1950 served apprenticeships, as compared with 77 percent who entered between 1961 and 1972 (Marshall, Glover, and Franklin 1980, p. 14).

Finally, national information regarding the numerical adequacy or inadequacy of apprenticeship trained workers is unlikely to have much influence on changing behavior of apprenticeship sponsors who make decisions regarding how many apprentices to admit each year based on local information. What is clearly needed is better quantitative information at the local level to help make such judgments.

Access to Apprenticeship

Some view apprenticeship to be a closed system reserved largely for sons and nephews of current craft workers, and a system that discriminates against minority and female applicants. In fact, fewer sons are following in their fathers' footsteps in the trades, and the proportion of relatives working in most apprenticeable crafts is probably no larger than that found in many other occupations. Further, over the past dozen years, in response to affirmative action pressures and with the help of special outreach efforts, apprenticeship has made great strides in including minorities. According to a BAT survey made in March 1981, 18.1 percent of apprentices were from minority groups. Increasing female participation in apprenticeship has come more slowly; but with goals and timetables for the participation of women in apprenticeship added to equal opportunity regulations in 1978, the direction of change is at least promising. In the same March 1981 BAT survey, 5 percent of apprentices were women.

The Length of Apprenticeship

The length of apprenticeship programs is a subject of constant criticism. Some think that apprenticeship is too lengthy for the level of skill and information it imparts. Others believe that the lengthy nature of the program discourages young people from applying. Some have argued that minority applicants particularly are dissuaded by the length of the program.

In response, it is pointed out that most apprenticeship sponsors do not encounter difficulty in attracting applicants, and those who do generally have been able to solve this problem by increasing the starting wage rate and adjusting the graduated wage increases or improving the wages and working conditions of the occupation generally.

Also, all apprenticeship programs have some provision for offering credit for prior training and work experience. Although such provisions are not always used by all programs, they offer a measure of flexibility in adjusting the length of training in apprenticeship. Similarly, the newer performance-based modes of training have introduced the opportunity for faster learners to progress to the completion of their apprenticeships more quickly.

Finally, it seems somewhat ironic for apprenticeship programs to be criticized for excessive length of training when one of apprenticeship's key functions is to provide a structure to ensure that individuals do not stay in a helper status indefinitely.

APPRENTICESHIP AND DISADVANTAGED YOUTH

Conceptually, the apprenticeship model offers many potential advantages in remedying the employment problems of youth. First, unlike other forms of training, it provides a built-in opportunity for youth to earn while they learn, thus reducing the opportunity cost of training to individual apprentices.

Second, its mode of training—practical learning by doing—has natural appeal to many youth who have been put off by school or book learning.

Third, the training occurs in a real job setting, which has to be taken seriously. Working on the job, youth have direct contact with employers and older workers. Those youth with initiative and motivation have an opportunity to be recognized by employers.

Barriers and Constraints: Perceived and Real

If one lines up the occupations in which teenagers are employed against those in which apprenticeship is most utilized, one finds a striking mismatch. Such youth can be found in retail sales work—an occupational field little touched by apprenticeship in this country.

About the only industry in which significant numbers of apprentices and teenage youth are employed is construction. But even in construction, due to the child labor provisions of the Fair Labor Standards Act and due to insurance regulations, youths cannot work in some hazardous skilled-job classifications until they are at least eighteen years old.

Given present levels and the current occupational configuration of apprenticeship training, redirecting the American apprenticeship system to serve disadvantaged youth in any significant way will be like making water flow uphill. It is not an impossible task, but one that goes against the natural inclinations of the system as it is presently constituted. Apprenticeship sponsors feel that they are making a major investment in their apprentices whom they may lose before the investment is recouped. Like other investors, apprenticeship sponsors avoid risk.

One approach to confronting this situation is to make disadvantaged youth less risky investments for employers. Indeed, this is the approach taken successfully through a wide variety of preapprenticeship projects and other efforts to better prepare youths for apprenticeships. These programs range from improved counselling to preemployment training such as that provided in the Job Corps.

However, accomplishments through this approach are limited by what might be termed the "funnel problem." There simply are few apprenticeship positions open and many of those are highly competed for.

Unless or until apprenticeship can be expanded significantly, the chances that it will offer much opportunity for disadvantaged youth are dim (also see next chapter of this work). This paper began on the hopeful note that heavy use of apprenticeship in Germanic countries was associated with low rates of unemployment for youth. If apprenticeship were used in the United States on the same scale as in Germany, Austria, and Switzerland, there would be over 7 million American apprentices in training—over twenty times the number presently indentured (Reubens 1980,

p. 1). Such an expansion could be accomplished only with a dramatic change in behavior on the part of American employers.

It is technically possible for American apprenticeship to serve younger and more disadvantaged individuals: United States apprenticeship regulations specify a minimum age of only sixteen years. However, what is technically possible is not always practical, given the institutional context. Apprentices in America are older than apprentices in other nations for numerous reasons—all good reasons in the minds of apprenticeship sponsors. Further, for the government to intervene forcibly in American apprenticeship would radically change the character of the system altogether.

One may lament that American apprenticeship does not serve more teenagers and school leavers because, as the German experience seems to indicate, apprenticeship has remarkable potential to ease the transition from school to work.

It should be recognized that there are significant differences in the institutional context between the United States and Germany. In Germany, apprenticeship is part of the educational system. Apprentices and employers have no obligations or expectations of one another after the term of apprenticeship ends. Further, German apprentices are paid monthly allowances rather than wages. Since almost the entire German labor force is under some form of collective bargaining, Germany has no minimum wage laws. However, on a relative scale, allowances paid to German apprentices are significantly below minimum wage scales in America. Finally, German employers take a strong interest in training youth. Industry invests in training in a large way; it is estimated that 90 percent of the dues collected by local chambers of industry and commerce are spent on training. Industry also has well-established apparatus to police the quality of training provided to apprentices by individual employers. In short, there is a good deal of self-regulation.

By contrast, in America, apprenticeship is a job and not a part of the educational system. Employers fully hope and expect to be able to retain apprentices after they complete the term of apprenticeship. American apprentices also must be paid at least the minimum wage. Finally, most American employers seem neither motivated nor organized to shoulder the responsibility of training youth.

Two practical problems with this scheme arise immediately. First, some employers may not train youth, preferring to take advantage of the cheap labor offered through the scheme. Moreover, even if they do train, employers may train youth narrowly in skills and procedures applicable only to the sponsor firm and not transferable to the rest of the economy.

Training allowances below minimum wages should be allowed only if real, documented, and meaningful training is provided to the youth involved. A brief glance at the history of apprenticeship in the United States is enough to expose the sorts of abuses and exploitation that occur without proper attention to training and labor standards in apprenticeship. Apprentices must not be used as cheap labor, and there have to be reasonable checks on the quality of training offered. Such quality checks can be accomplished only through a three-pronged effort including: (1) a stronger apprenticeship system with a more rigorous determination of apprenticeability of occupations and training standards; (2) greater involvement of schools, especially vocational education; and (3) perhaps most important, a system of industry self-regulation.

Details of a particular proposal need to be worked out, but we need not go to Germany to find model programs upon which to build. One such effort is the attempt to blend cooperative education with apprenticeship, as has been demonstrated in seven selected school districts under the Apprenticeship School-to-Work Linkage Project initiated by the U.S. Department of Labor in 1978. Through this project, high school cooperative education students were placed into regular apprenticeships with advanced standing upon high school graduation. As might be anticipated, the Apprenticeship School-to-Work Linkage Project has encountered significant administrative difficulties. However, all but one of the eight initial pilot projects have been able to solve these problems over time and have demonstrated success.

As the administrative difficulties encountered by the Apprenticeship School-to-Work Linkage Project attest, aiming apprenticeship at adolescents is not simply a matter of changing to a younger mix of apprentices. It involves establishing a different set of institutional arrangements. Forcing our traditional apprenticeship system to serve adolescents without some new institutional arrangements would be impractical and doomed to failure.

Frankly, I am not optimistic that an appropriate institutional environment for implementing a subminimum wage can be developed in America for several reasons. First, the employers who would find the subminimum wage most attractive are not those most likely to offer meaningful skill training. Indeed, if employers do offer meaningful craft training to teenagers, the overall price tag is likely to cost far more than even paying full minimum wages. Second, experience over the past forty years has demonstrated that it is very difficult for the U.S. Department of Labor to enforce quality standards on the training offered through apprenticeship. To be certain, part of the problem has been that the only enforcement tool that BAT has had to date is the power to deregister programs. Providing control over exemptions from minimum wage laws would give the BAT a little more leverage; but it is doubtful that even this would be a tool sufficient to enforce quality training. Third, involving apprenticeship agencies and schools *more* in private apprenticeship programs runs directly counter to the trend of *reducing* governmental regulation and interference with industry so popular in political circles today. Fourth, our system of public education is so decentralized that implementation of such a scheme in the thousands of school districts across the country would present overwhelming administrative difficulties. Fifth, reducing the wages paid in apprenticeship undermines one of the key advantages apprenticeship offers disadvantaged youth—namely, earning while learning. Presumably, disadvantaged youth may need more monies than other youth and thus they would be less able to participate in apprenticeship. Sixth, it is doubtful that sufficient numbers of youths could be attracted to work in apprenticeships offered at subminimum wages. Finally, self-regulation cannot be imposed on American industry. Industry itself must take the lead in formulating and administering training standards. I do not see this effort forthcoming on any general scale.

In recent years, there have been various other suggestions offered to expand the use of apprenticeship in America. Among them are the following:

- Financial incentives such as tax credits or matching grants or loans to industry training trust funds
- Advertising and publicity campaigns to promote apprenticeship among employers and the general public
- Increased promotion and development efforts by staff of the Bureau of Apprenticeship and Training and state apprenticeship agencies
- Promotion and development contracts to industry associations, unions, schools, community groups, or professional associations to develop apprenticeship in selected industries
- Making apprenticeship mandatory for government contractors and/or others
- Expanding the use of apprenticeship by federal agencies through a presidential executive order

Just as with the proposal for training allowances below the minimum wage rate, each one of these suggestions involves problems. Each also involves an increased role for government.

In summary, if apprenticeship is expected to serve disadvantaged youth, it must be significantly expanded. Further, the orphan status that apprenticeship now endures in the U.S. Department of Labor and in the vocational education community must be eliminated, and apprenticeship must become a centerpiece of employment and training policy in the United States.

Perhaps most of all, we must come to realize that training is indeed a joint enterprise deserving and demanding the close cooperation of both the private and public sectors. Further, it is a joint venture that strongly influences our nation's productivity, economy, and trade position in world markets.

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STEPHEN M. HILLS

10

How Craftsmen Learn Their Skills: A Longitudinal Analysis

OVERVIEW

Too little is known about the process of skill acquisition for jobs in the United States. This study examines the training of craftsmen, a group of individuals who by definition have attained skilled training for their jobs. Skilled craftsmen acquire training in a number of ways, both formal and informal. Classified as formal training are the vocational education programs provided by high schools, technical institutes, and junior colleges. Also included are government training programs, company training other than on-the-job, and apprenticeships. All other methods are customarily defined as informal.

Our study provides a picture of the training process: when it occurred, from what sources, and to what degree it was formal or informal. We expected to find that skilled craftsmen received more of their training formally than young men who worked in other occupations. Among the questions we addressed are these: How important is informal, on-the-job

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training for skilled craftsmen? What inferences can we make about the way those who receive no formal training acquire their skills? Does informal training yield economic benefits as high as the benefits from formal training? What proportion of the sample received skilled, manual, or vocational training but did *not* ultimately find employment as craftsmen? What kind of work did they do instead? Are there significant racial differences between the training process and its outcomes?

Previous Research

The lack of attention to the training of highly skilled workers in part reflects the shift in the federal government's policy priorities between the early 1960s and the present. A concern for highly skilled workers gave impetus to the growth in spending for federal employment and training programs initiated in the 1960s. Automation and presumed skill bottlenecks in the economy were two important rationales for passage of the Manpower Development and Training Act (MDTA) of 1962. Subsequently, emphasis shifted from skilled workers of all age groups to unskilled workers who were young or poor. The provision of entry-level jobs or basic skills became major objectives of federal employment and training policy in the mid-1960s and throughout the 1970s. Now the federal government's emphasis has shifted again to revitalization of the economy, and labor leaders are expressing renewed concern over threatening economic dislocations that stem from shifting trade patterns and capital flows. These changes may bring about a revival of interest in skills acquisition and technical training.

One of the earliest research projects funded by MDTA was undertaken by the Bureau of Labor Statistics (BLS). Through a supplement to the April 1963 Current Population Survey, the BLS asked respondents to report retrospectively on how they had been trained for their jobs (U.S. Dept. of Labor 1964). Before 1963, such a nationwide survey of workers' preparation for jobs had not been done.

The BLS survey yielded a wealth of descriptive information on training in the early 1960s. For example, 51 percent of male workers age twenty-two to thirty-four with less than three years of college had taken formal job training,* and about one-half of these were using their training on their current or last job. Over half the men of all ages who had received no training reported that they had acquired skills informally on the job. Those who had no training also had the least education: more than half had eight years or less of schooling.

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*See U.S. Department of Labor 1964, table 1, p. 34. Women had more training than men, 57 percent of those twenty-two to thirty-four with less than three years of college.

BLS researchers demonstrated a close relationship between job training and the level of education. They suggested that though schools offered the best prospects for expanding vocational training, strong emphasis also should be placed on alternative ways of providing training to school dropouts who need it most. BLS researchers also found that workers with less than eight years of schooling but with some vocational training had significantly lower unemployment rates than those with no training, further underscoring the need to direct special training efforts toward school dropouts.

This study extends and updates research initiated by the BLS in 1963. We restrict the analysis to men whose jobs require significant skills, those working in the various crafts. Using a longitudinal file of information on employment and training, we have built a record of skill acquisition for a national sample of young men who had training in the late 1960s and early 1970s and who ultimately became craftsmen.

THE DATA

Data for the study were obtained from the young men's cohort of the National Longitudinal Surveys (NLS). Between 1966 and 1976, the NLS fielded nine interviews with a sample originally numbering 5,000 men. Annual personal interviews were conducted from 1966–1971, telephone interviews in 1973 and 1975, and another personal interview in 1976.* In each interview information on training was updated. Given the sporadic nature of training, this longitudinal file has significant advantages over single surveys, which rely on recall to obtain information retrospectively. If we were to analyze a cross-section of young men drawn from 1976, we would count as craftsmen only those who had persisted in their trades and who were thus least affected by the recessionary conditions in 1975 and 1976. We avoid this form of selection bias by selecting all those who were craftsmen at any time since leaving school. Our sample, then, consists of 1,525 young men who at ages twenty-four to thirty-four had worked as skilled craftsmen at some time since leaving school, 1,152 whites and 373 blacks.* The men were on the average twenty-six years old and had eight years of postschool labor market experience. Men with seven to ten years of labor market experience had completed their training in an average of four to five years after leaving school. The overwhelming majority had accumulated less than three years of college by the time they left school, but approximately 8 percent of the whites and 2 percent of the blacks had fifteen or more years of regular schooling. Seventy-four percent of the craftsmen were high school graduates.

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* The National Longitudinal Surveys have been funded by the U.S. Department of Labor since the mid-1960s. Surveys are developed at the Center for Human Resource Research, The Ohio State University. The surveys now consist of five separate cohorts: men and women who were age fourteen to twenty-four in the mid-1960s, women who were forty to fifty-four, and men who were forty-five to fifty-nine at that time, and a new cohort of young men and women who were age fourteen to twenty-one in 1979. For more information on the NLS see the *NLS Handbook*, the Center for Human Resource Research, The Ohio State University, revised 1981.

INCIDENCE OF FORMAL TRAINING

Due to the skilled nature of the jobs that craftsmen held, we expected an incidence of formal training somewhat higher than for all young men. To test this expectation, we selected a subset of craftsmen age twenty-four to thirty-four and compared them with men of the same age who had never become craftsmen. For both groups, we selected those with less than three years of college, in order to exclude those whose jobs required more education than crafts occupations required. We found that craftsmen did, indeed, receive significantly more formal training than their counterparts who did not become craftsmen. A little more than two-thirds of white craftsmen age twenty-six to thirty-one had received some form of skilled manual training. Less than half of similarly aged whites who *never* became craftsmen had skilled manual training. These relationships were similar for blacks (see table 10-1).

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* The definition of craftsman is based on an occupational coding. In the NLS, jobs are assigned three-digit Census occupational codes. From a young man's postschool employment history, we checked the occupational codes for his current or last job in each survey year. If multiple jobs were held in a survey year, we also checked the longest job held. A young man was considered a craftsman if any of these jobs were coded as a crafts occupation. This is a liberal definition that includes those who worked for relatively short periods of time as craftsmen. Since no restriction was placed on the amount of income earned or the amount of time worked in a crafts occupation, our definition includes young men who worked for relatively short periods of time as craftsmen.

TABLE 10-1

Proportions of Craftsmen and Noncraftsmen Who Received Skilled Manual Training (Weighted Percentages)

Age	*Skilled Craftsmen*	*Frequency % with any formal training*	*Noncraftsmen*	*Frequency % with any formal training*
Whites:				
24-25	206	61.9	243	37.4
26-28	267	66.0	266	44.3
29-31	149	69.4	138	44.1
32-34	130	72.4	196	40.1
Blacks:				
24-25	90	54.2	134	38.7
26-28	64	59.6	142	37.2
29-31	48	60.8	85	29.3
32-34	25	58.0	65	35.3

SOURCE: All tables and descriptive statistics are based on the National Longitudinal Surveys and were produced for this report.

NOTE: All descriptive statistics are weighted to produce national population estimates. The weights adjust for differential rates of attrition over time among subgroups of the original sample surveyed in 1966. The actual sample sizes on which the weighted population estimates are based are shown in the columns labeled "frequency." This convention will be followed throughout the paper.

UNIVERSE: Men who were twenty-four to thirty-four when last worked as craftsmen or men who were twenty-four to thirty-four in 1976 and had never been craftsmen. All had less than three years of college and were interviewed in 1976. Craftsmen were those who were in a crafts occupation at any time (current or last job at each interview) since the first time they left school.

SECULAR CHANGES IN TRAINING

Crafts training may be had in a number of settings. We enumerated the sources of training for all young men surveyed in 1976 by the NLS and compared our data with the earlier BLS study. Table 10-2 shows the extent of training for all men surveyed as well as the sources of training. Though our definitions of training may not correspond exactly with those used in the earlier BLS study, we can observe important changes in both the extent and kind of training young men receive.*

The amount of training men received rose sharply during the period 1963 to 1976. Table 10-2 shows that only 46 percent of men twenty-two to sixty-four years old had received training by 1963, compared with more than 70 percent for the full NLS sample of young men by 1976. Even if the BLS sample is restricted to men age twenty-two to thirty-four, a sample more comparable in age to the NLS respondents, only 51 percent reported prior training in 1963.

The sources of training have shifted considerably over time. In 1963 most training took place in educational institutions; 30 percent of the training programs were offered through high schools. By the mid-1970s, however, only 12 percent of the training programs young men reported were offered through high schools. Sources of training that showed the most rapid growth were company training, whose share of the total grew from 8 percent to 16 percent, and "other civilian training," a category that includes government training such as CETA. The growth in this category for blacks was particularly large, accounting for 20 percent of the programs blacks reported in 1976.

In 1976 blacks shared a similarity to respondents from the 1963 survey insofar as one of their most important sources of training was the high school. Blacks reported that 18 percent of their training programs originated in high school. Blacks received less of their training through the military; but interestingly, little difference was reflected in the proportions of blacks and whites reporting company training or apprenticeships. A smaller proportion of *all* blacks were participating in *either* of these latter two types of training, since only 57 percent of all black men reported any training, compared with 76 percent of white men. A significant

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* In our study of craftsmen, we will define formal training to include only skilled manual training. For comparison with the BLS we include all kinds of training.

TABLE 10-2

Training by Source for NLS and BLS Surveys (Weighted percentages)

	NLS whites, 1976 24-34 years old		*NLS blacks, 1976 24-34 years old*		*BLS study, 1963 all persons 22-64 years old*
	*No. of individuals with training**	*% of total individuals*	*No. of individuals with training**	*% of total individuals*	*% of total individuals*
Any training — civilian or military	1,682	76.0	654	56.5	46.1
Total		100		100	
	No. of programs reported	*% of total programs*	*No. of programs reported*	*% of total programs*	*% of total programs*
Military	536	16.5	116	12.1	16.2
Civilian					
High school	394	11.4	218	17.5	29.5
Junior or community college	228	8.1	59	8.9	3.8
Business college or technical institute	482	15.1	164	15.7	23.6
Correspondence course	204	7.0	25	3.3	7.7
Apprenticeship	316	9.1	92	7.9	11.7
Company training	518	16.6	158	15.0	7.5
Other civilian	474	16.3	205	19.7	0.1
Total programs		100		100	100

UNIVERSE: Men with less than three years of college.

* Unweighted sample sizes from the NLS. See note in table 10-1.

gap between black and white rates of training remained in 1976 despite the secular increase in the amount of training blacks received. The 1963 study reported 37 percent of blacks ages twenty-two to thirty-four as having some form of training, compared to 51 percent for men of both races. The more recent NLS data show that 57 percent of black young men received training, compared to 74 percent for both blacks and whites.

The training for skilled crafts provides an interesting contrast to the training experience of all young men. For all young men, informal methods of training were important in the skills acquisition process, despite the secular increase in training. For craftsmen, informal training was even more important. Forty-one percent of whites and 45 percent of blacks had received only informal training prior to the time we found them at work as craftsmen (table 10-3).*

The sources of training for craftsmen differed considerably from the sample we drew of all young men. For craftsmen, both apprenticeships and company training played a prominent role, at least for whites. Together, these two kinds of training programs represented about 38 percent of the programs reported by craftsmen who had training, but among the full sample of young men these two types of training accounted for only one-fourth of all programs taken.

For black craftsmen, the apprenticeship route was not nearly as important as high school or other training. Sharp differences also existed by race in the amount of skilled training received through the military, where blacks received much less training than whites.

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* Measures of informal training, however, are not completely comparable between the sample of all young men (craftsmen and noncraftsmen) and the sample of craftsmen. The craftsmen are younger, ranging in age from sixteen to thirty-four, since we identify them at any time since they left school. The full cross-section of young men was drawn from 1976 when they were ages twenty-four to thirty-four only. As the craftsmen age, they may obtain more training. For example, we calculated the proportions of craftsmen who received only informal training and whose ages were more than the median age of twenty-six. We found that formal training grew in importance for the older craftsmen. Of the whites, 68 percent of the older craftsmen had formal training whereas the comparable statistic for the younger craftsmen was only 52 percent. Of the older blacks, 61 percent had had formal training compared to 51 percent for the younger blacks. A second difference exists in the definition of formal training. For the 1976 cross-section of men, we counted all training sources. For craftsmen, we counted only skilled manual training.

TABLE 10-3

Skilled Manual Training by Source, for NLS Craftsmen
(Weighted percentages)

	Whites		*Blacks*	
	No. of individuals with training	*% of total individuals*	*No. of individuals with training*	*% of total individuals*
Total		100		
Any training	666	58.6	194	55.0
School training	315	27.6	89	25.8
Job training	345	31.3	77	20.5
	No. of programs reported	*% of total programs*	*No. of programs reported*	*% of total programs*
Military	140	13.3	23	9.3
Civilian				
High school	190	16.1	65	22.9
Junior or community college	58	5.1	19	7.2
Business college or technical institute	119	11.6	26	9.2
Apprenticeship	214	19.6	42	13.9
Company training	196	18.5	44	15.1
Other skilled, manual training	167	15.7	61	22.3
Total programs		100		100

UNIVERSE: Young men who were craftsmen at some time between leaving school and attaining ages twenty-four to thirty-four. All training measures were taken in the last year that we found them working as craftsmen.

Two questions are raised by these initial results. First, who are the two-fifths of the young men who reported no training and yet were employed in occupations requiring very specific skills? How did they learn these skills? Second, what do racial differences in training imply about the structure of jobs for blacks in the various crafts?

SOURCES OF INFORMAL TRAINING

The bulk of craftsmen were working in either construction or manufacturing, these two industries accounting for about 60 percent of craftsmen (table 10-4). Informal training characterizes the construction industry: craftsmen here were most likely to learn their skills informally.

TABLE 10-4

Degree of Formal Training for Craftsmen by Industry (Weighted percentages)

Industry	*Whites*		*Blacks*	
	Freq. (% of total)	*% with any formal training*	*Freq. (% of total)*	*% with any formal training*
All	1,131 (100)	58.6	366 (100)	54.4
Construction	364 (32.2)	49.4	96 (26.2)	49.4
Manufacturing	319 (28.2)	63.4	133 (36.3)	55.8
Wholesale and retail trade	160 (14.1)	67.3	43 (11.7)	45.9
Business and repair services	106 (9.4)	57.2	30 (8.2)	68.3
Transportation, communication, and other public utilities	89 (7.9)	69.0	28 (7.7)	70.3
Other	93 (8.2)	56.3	36 (9.8)	48.5

UNIVERSE: Same as in table 10-3 except that data for twenty-one whites and seven blacks are not available by industry.

Apprenticeships are also more common in construction than in other industries (table 10-5). Apprenticeships institutionalize the process, but a large number of workers pick up skills on their own or through informal apprenticeships.

TABLE 10-5

Training Participation of Craftsmen by Type of Training, in Construction, Manufacturing, or Other Industry (Weighted percentages)

	Whites		
	Construction (n = 364)	*Manufacturing* (n = 319)	*Other* (n = 448)
Percentage with apprentice training	20.5	23.3	15.2
Percentage with company training, but no apprentice training	4.6	12.1	18.4
Percentage with only training other than apprentice or company training	24.4	28.0	29.3
Percentage with no training	50.6	36.6	37.1
Total	100.0	100.0	100.0
	Blacks		
	Construction (n = 96)	*Manufacturing* (n = 133)	*Other* (n = 137)
Percentage with apprentice training	15.9	5.8	12.0
Percentage with company training, but no apprentice training	2.5	11.0	13.9
Percentage with only training other than apprentice or company training	31.1	38.9	30.5
Percentage with no training	50.5	44.2	43.6
Total	100.0	100.0	100.0

UNIVERSE: Same as in table 10-4.

An analysis of separate crafts shows that informal training was most likely to be acquired by painters, roofers, road machine operators, printers, and various kinds of inspectors (table 10-6). Other crafts rely much more heavily on formal training, but in none does the proportion come close to 100 percent. Crafts that rely most heavily on formal training are electricians and linemen, but even in these occupations fully one-quarter of the young men reported no formal training.

TABLE 10-6

Degree of Formal Training Among Craftsmen by Occupation (Weighted percentages)

	Whites		*Blacks*	
	Freq.	*% with formal training*	*Freq.*	*% with formal training*
All	1,152	58.5	373	55.0
Carpenters and cabinetmakers	156	46.7	29	55.1
Painters	45	28.4	31	40.1
Electricians	51	74.3	14	76.1
Plumbers	45	61.0	10	69.3
Roofers	23	30.8	6	56.0
Other construction workers	31	46.7	28	48.5
Inspectors	28	32.7	11	33.5
Mechanics and repairmen	416	64.9	123	55.5
Machine operators	99	69.5	32	63.8
Road machine operators	56	40.5	21	26.2
Metal workers	59	70.1	18	76.1
Linemen	52	77.0	12	91.7
Typesetters, engravers, printers	34	41.2	7	41.6
Miscellaneous	57	59.3	31	44.0

UNIVERSE: Young men who were craftsmen at some time between leaving school and attaining ages twenty-four to thirty-four. All training measures were taken in the last year that we found them working as craftsmen.

Given the unionized nature of many formal apprenticeship programs, young men who enter the crafts through an informal process of training should be more likely to work in nonunion jobs. In construction this is certainly true (table 10-7). But for blacks in manufacturing, lack of formal training per se does not seem to be a barrier to employment in the unionized sector. Blacks in union jobs are just as apt to be trained informally as blacks in nonunion jobs.

TABLE 10-7

Degree of Formal Training by Union Status (Weighted percentages)

	Whites		*Blacks*	
	Freq. (% of total)	*% with any formal training*	*Freq. (% of total)*	*% with any formal training*
Construction	226		45	
Union	88 (38.9)	71.7	7 (15.6)	88.2
Nonunion	138 (61.1)	47.9	38 (84.4)	46.0
Manufacturing	203		63	
Union	93 (45.8)	75.0	43 (58.9)	62.9
Nonunion	110 (54.2)	58.5	30 (41.1)	63.5
Other industries	293		86	
Union	87 (29.7)	78.2	17 (19.8)	65.6
Nonunion	206 (70.3)	61.4	69 (80.2)	57.0

UNIVERSE: (1) Young men who were craftsmen at some time between leaving school and attaining ages twenty-four to thirty-four; and (2) who were employed in 1969, 1970, 1971, or 1976. Training measures were obtained in the last year that they were craftsmen. Union status was assigned for the last year that we found them employed.

Few other clues could be found about how informal training is meted out. Several hypotheses were explored to explain differences between respondents who chose informal training versus formal training prior to working as craftsmen. We wondered whether a father who was a craftsman could have passed skills on to his son, thereby eliminating the need for formal training. A fifth of those trained informally did indeed have fathers who were craftsmen, but even more of those trained formally were second-generation craftsmen (table 10-8). Those trained informally had about the same IQs and levels of education as those formally trained. Whites trained informally were somewhat younger and had less labor market experience since leaving school; they were also more apt to have come from rural areas. We examined the distribution of jobs young men held immediately after leaving school, hypothesizing that craftsmen trained informally may have acquired skills previously in other occupations and then transferred them to the crafts. Occupational distributions in the first job after leaving school were similar between those trained formally and informally, with one exception: blacks trained informally were more likely to have had a job in farming after leaving school than were those who were trained formally. This finding lends some support to the notion that farming allows one to pick up a number of skills useful in the crafts. Both blacks and whites with informal training were also more likely to have worked as professional, technical, and kindred workers immediately after leaving school, a finding that supports the transfer of training hypothesis as well. These differences are relatively small, nevertheless, and do not go far in explaining the amount of informal training for craftsmen.

On the whole, few traces of the process of informal skill acquisition remain in the longitudinal record for us to identify. Clearly, a significant proportion of respondents were not excluded from craftsmen positions because of lack of formal training alone. Even for crafts that rely heavily on formal training, as many as one-fourth were found employed as craftsmen but reported no prior formal training.

RACIAL DIFFERENCES IN THE STRUCTURE OF TRAINING

The skills acquisition process for blacks is quite different than for whites. Table 10-1 showed that participation in apprenticeship programs differed little by race, but when we select only men who succeed in finding skilled crafts positions, the differences are great. In the late 1960s

TABLE 10-8

Characteristics of Skilled Craftsmen by Receipt of Formal Training (Standard deviations in parentheses)

	Whites (Sample size = 1,152)		*Blacks* (Sample size = 373)	
	With training	*No training*	*With training*	*No training*
Sample size (percent)	666 (57.8)	486 (42.2)	194 (52.0)	179 (48.0)
Characteristics				
Mean no. of years since left school	9.1 (3.95)	7.5 (4.68)	8.5 (4.26)	8.4 (4.98)
% who at age fourteen had a skilled craftsman father (or head of household)	26.9 (.44)	21.5 (.41)	10.1 (.30)	7.7 (.27)
Mean age	26.8 (3.84)	25.3 (3.99)	26.0 (4.31)	25.6 (4.19)
Mean IQ*	100.4 (10.6)	101.0 (11.8)	86.1 (11.1)	85.3 (8.9)
Mean education	11.9 (1.6)	11.9 (2.5)	11.4 (1.8)	10.6 (2.4)
% rural	29.7	31.1	34.7	33.1
% whose first job after school was:				
Professional, technical, or kindred	2.1	1.6	0.0	1.4
Farm laborer or farm foreman	3.6	3.4	5.2	6.0

UNIVERSE: Same as in table 10-3.

*Sample sizes were reduced to 812 whites and 159 blacks for IQ measures. Of the whites in the reduced sample 61 percent had training; of the blacks, 57 percent.

and early 1970s much lower proportions of blacks than whites entered the crafts through formal apprenticeships (table 10-5). In the construction industry, blacks compensated for their low rates of apprenticeship by higher rates of school or other training. In manufacturing, blacks received more "other civilian training" than whites, but not enough to account for the extremely large discrepancies between black and white apprenticeships. Much attention has been paid to the differential treatment of minorities in the construction industry, but these data show the problem to be much more severe in manufacturing. In the "all other industry" category, rates of apprenticeship differ less by race; but here, blacks received less company training. If formal training pays off, each of these racial differences could prove disadvantageous for black craftsmen.

Another significant racial difference exists in the degree of military training reported by blacks relative to whites (see table 10-3). There are a number of explanations for this difference. First, a smaller proportion of blacks reported having served in the military by 1976; many of these had served prior to 1966, when disproportionate numbers of whites entered the military. Of those who did serve after 1966, attrition from the NLS data sample differentially eliminated more blacks than whites.

Differential rates of reported military service did not account for all differences in military training, nevertheless. If we select only those young men who reported military service, considerably more of the whites received military training than did blacks (table 10-9). One explanation for this finding is that blacks were more likely to be drafted into the U.S. Army or the U.S. Marines, whereas enlistees in the U.S. Air Force, U.S. Navy, or U.S. Coast Guard were more likely to have received skilled training. In fact white and black draftees did receive the same amount of training, but far more white enlistees than black received training during this period. White enlistees may have been more qualified for training than blacks (more highly educated, for instance); furthermore, blacks who were trained may have been more likely to reenlist in the military and thus never reinterviewed in the NLS sample. Our data cannot determine which, if either, of these possibilities is true. The data do show that blacks with military training had difficulty transferring their training to the civilian sector. Only 4 percent of the blacks who had skilled manual training in the military reported using it in employment subsequent to military service, but 20 percent of the whites made use of their military training.*

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* "Subsequent employment" is the job held at the time of the first interview and after returning from the military. Although blacks have more difficulty in making a transition from the military to the civilian sector, it is possible that blacks ultimately will find crafts jobs, and the difference between blacks and whites therefore would narrow.

TABLE 10-9

Degree of Training Received During Military Service by Branch, Enlistment Status, and Race (Weighted percentages)

	Percentage who received training	*Sample size*
Whites		1,176
In U.S. Army or Marines	20.2	775
Enlisted	21.5	521
Drafted	17.3	253
In U.S. Air Force, Navy, or Coast Guard	33.2	400
Enlisted	33.2	400
Drafted	0.0	0
Blacks		295
In U.S. Army or Marines	13.1	224
Enlisted	10.8	96
Drafted	15.0	128
In U.S. Air Force, Navy, or Coast Guard	25.0	70
Enlisted	25.7	67
Drafted	0.0	3

UNIVERSE: All young men who reported service in the military in 1966, 1969, 1971, or 1976.

In summary, if formal training provides an economic return for craftsmen, then blacks are put at a disadvantage in a number of ways. Entrance to the crafts for blacks is more likely to come through informal training, reflecting in part their very low rate of participation in apprenticeships relative to whites. In manufacturing, higher rates of participation in company or other training only partially offset the extremely low rates of black apprenticeships in this sector. Military training, which could serve to offset some of the disadvantage for blacks, was not transferred to the civilian sector as readily for blacks as for whites.

SKILLED MANUAL TRAINING FOR NONCRAFTSMEN

The large number of blacks who reported little use of their military training raises the question, What are the occupations young men accept if their skilled manual training is not applied to the crafts? For all noncraftsmen who had received skilled manual training before 1976 the NLS contains data on the longest job held in the previous five-year period. We examined the occupational distribution of these jobs by race and found that 33 percent of white noncraftsmen could be labeled upwardly mobile. Rather than use their skilled manual training in the crafts, these men progressed to professional or technical jobs or obtained positions as managers, proprietors, or foremen. Another 30 percent of whites obtained positions as operatives rather than craftsmen.* The remaining one-third of the whites were scattered across occupations where skilled manual training would appear to be of little help—laborers, or service, clerical, or sales workers (table 10-10).

Much less upward mobility can be inferred for blacks: only 10 percent of those with skilled manual training ultimately got jobs as professional or technical workers or as managers, proprietors, or foremen. Forty-three percent were employed as operatives, and another 40 percent had relatively unskilled jobs as clerical, sales, or service workers or as laborers.

These data demonstrate again the difficulties blacks face in applying their formal training to jobs that utilize it. Given the lower probability of linking formal training with craftsmen positions, it is not surprising that a higher proportion of blacks enter the trades through informal routes.

Certain types of training may improve the probability that skilled training will be followed by crafts positions. For whites and blacks alike, company or apprenticeship training was more likely to ensure craft employment, but even here the probabilities were not high: about 40 percent of whites and 54 percent of blacks with apprenticeship training did *not* become craftsmen (table 10-11). Data not reported here show that about half of these could again be labeled upwardly mobile, i.e., they were drawn out of crafts occupations to work in occupations that would tend to be better in pay, responsibility, or skill required. The other half were found employed as operatives, service workers, and so forth where skills are less well utilized than in the crafts.

If apprenticeships have positive returns, greater emphasis on successful completion of apprenticeships and better incorporation of apprentices, particularly blacks, into the crafts should have payoffs for business enterprises.

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*A number of the operative positions could of course require skilled manual training.

TABLE 10-10

Percentage Distribution of Longest Job in Last Five Years for Noncraftsmen in 1976 Who Received Skilled Manual Training

	Whites		*Blacks*	
	Freq.	*Occupational class as % of training*	*Freq.*	*Occupational class as % of training*
All	421	100	161	100
Professional, technical, and kindred workers	76	18.0	11	7
Managers, officials, and proprietors	50	12.8	5	3
Clerical workers	31	7.2	12	7
Sales workers	26	6.9	4	2
Craftsmen*	6	1.4	5	3
Foremen	13	2.6	1	1
Operatives	131	30.0	70	43
Service workers	33	8.5	20	12
Farmers, farm managers	14	3.6	1	1
Farm laborers and farm foremen	7	1.7	4	3
Laborers	28	6.4	26	16
Armed forces	6	0.8	2	1

UNIVERSE: Young men who were not craftsmen (as craftsman is defined in table 10-3) but who received some type of skilled manual training in school, in the military, or on the job.

*Since the table is restricted to noncraftsmen, the eleven respondents who report craftsmen jobs indicate some degree of error in defining who were craftsmen. The work history from 1971-1976 is not complete and some respondents may be reporting a job held while still in school. Either may be the source of error.

TABLE 10-11

Proportions of Young Men with Skilled Manual Training Who Became Craftsmen, by Source of Training (Weighted percentages)

Source of training	*Freq.*	*Whites % who became craftsmen*	*Freq.*	*Blacks % who became craftsmen*
No training	1,746	21.8	512	22.4
Any training	1,071	51.9	335	45.0
Military training	255	46.5	42	44.1
Civilian training	934	55.3	313	44.7
School training	485	56.9	160	40.2
High school	305	53.9	110	35.7
Junior or community college	88	58.7	23	85.1
Business college or technical institute	162	66.6	54	39.5
Job training	445	62.7	113	50.0
Apprenticeship	281	60.7	54	46.2
Company training	227	71.4	66	55.9
Other training	265	53.8	111	50.3

UNIVERSE: All young men with skilled training, age twenty-four to thirty-four and interviewed by the NLS in 1976.

THE WAGE RATE ADVANTAGE FOR CRAFTSMEN WITH TRAINING

We now test whether or not training results in a positive wage differential for craftsmen. Many past studies have measured returns to training by analyzing individuals across the full spectrum of occupations. To focus on any given subset of occupations such as craftsmen creates sample selection problems since we did not always have a full record of the linkages among jobs, and the craftsman's occupation is particularly troublesome due to movement in and out of the crafts.* A young man may prepare for a craftsman's job, work there for a time, and then switch to something else; we have already observed the mobility of individuals who have gained skilled manual training but have not become craftsmen.

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* A sample comprised of young men who have been craftsmen is more than twice as large as a sample of craftsmen drawn from 1976 alone.

The traditional analysis based on a full cross-section of occupations combines two effects: first, the direct effect of training on earnings in the job to which the training applies, and second, the indirect effect of training on mobility through a string of jobs related to the first job for which the training was directly applicable. Training in this second sense serves its most important purpose by helping the worker obtain his first good job, which leads to even better positions. By restricting our analysis to men who have been craftsmen, we measure only the return to training within one occupational group and omit any influence of training on mobility out of the crafts. We ask whether in this sense formal training is better than informal methods for acquiring skills and, if so, what the relative advantage may be.

To establish a measure of wage advantage we used a standard human capital model with log wages expressed in 1976 dollars as the dependent variable. Independent variables are as shown in table 10-12. Controls for education are nonlinear due to the large number of respondents with twelve years of schooling. High school dropouts and those with some college are compared with those who hold a high school degree. We further controlled for IQ, using mean replacement of the race specific means to deal with missing data.* Other personal characteristics controlled for were veteran status, urban residence, race, residence in the South, and marital status. Control variables specific to the job or the job environment included industry variables (construction and "other industries" compared with manufacturing), variables controlling for a craftsman's self-employed status, each young man's job tenure and total work experience, the area unemployment rate as of 1970, and the year in which the young man was last a craftsman (i.e., the year in which wages were measured).†

The results of a linear OLS estimation of this wage model are shown in table 10-12. Training is strongly significant: young men who enter a craft with formal training, other things equal, receive wages 10 percent

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* About 30 percent of the whites and 57 percent of the blacks had missing observations.

† Dummy variables controlling for year when last a craftsman measure cyclical fluctuations in real earnings growth.

TABLE 10-12

OLS Estimated Wage Equations for Craftsmen
Dependent Variable: Ln of Hourly Rate of Pay in 1976 Dollars
(t-values)

Independent variables	*Column 1*	*Column 2*	*Column 3*
Any training	.097		
	(4.88)		
Training hierarchy 1			
Apprentice training		.191	
		(6.91)	
Company training		.079	
		(2.43)	
Technical institute training		.042	
		(1.13)	
Other civilian training		.033	
		(0.99)	
Military training		.083	
		(1.75)	
High school training		.066	
		(1.71)	
No training		—	
Training hierarchy 2			
High school training			.090
			(3.22)
Military training			.058
			(1.45)
Other civilian training			.062
			(1.95)
Technical institute training			.154
			(3.97)
Company training			.100
			(2.74)
Apprentice training			.156
			(3.63)
No training			—
Dropout	-.113	-.104	-.109
	(-4.67)	(-4.34)	(-4.51)
High school graduate	—	—	—
Attended college	.095	.096	.092
	(3.59)	(3.65)	(3.48)
Years since left school	.0156	.0151	.0157
	(4.76)	(4.62)	(4.79)

NOTE: This and all subsequent regressions have been estimated using unweighted data.

TABLE 10-12 (continued)

Independent variables	*Column 1*	*Column 2*	*Column 3*
Veteran	.018	.022	.030
	(0.88)	(1.05)	(1.32)
Tenure	.0167	.0171	.0166
	(5.09)	(5.24)	(5.02)
SMSA	.130	.122	.131
	(6.08)	(5.73)	(6.12)
South	-.178	-.177	-.179
	(-8.36)	(-8.36)	(-8.36)
Never married	-.159	-.157	-.160
	(-6.51)	(-6.46)	(-6.53)
IQ	.0014	.0013	.0015
	(1.52)	(1.41)	(1.60)
Owner	-.188	-.184	-.181
	(-4.90)	(-4.83)	(-4.71)
Construction	.072	.067	.068
	(2.79)	(2.62)	(2.63)
Manufacturing	—	—	—
Other industries	-.126	-.123	-.126
	(-5.51)	(-5.36)	(-5.51)
1970 Census unemployment rate	.0019	.0014	.0021
	(0.41)	(0.31)	(0.46)
Black	-.070	-.065	-.069
	(-2.66)	(-2.50)	(-2.62)
Year = 1966	—	—	—
Year = 1967	.090	.095	.094
	(1.43)	(1.53)	(1.50)
Year = 1968	.164	.174	.170
	(2.55)	(2.73)	(2.65)
Year = 1969	.120	.127	.124
	(1.88)	(2.00)	(1.94)
Year = 1970	.111	.115	.116
	(2.02)	(2.12)	(2.13)
Year = 1971	.116	.114	.116
	(2.28)	(2.24)	(2.28)
Year = 1973	.142	.147	.149
	(2.89)	(3.02)	(3.03)
Year = 1975	.110	.113	.113
	(2.21)	(2.27)	(2.26)
Year = 1976	.155	.160	.157
	(3.19)	(3.31)	(3.23)
Constant	5.75	5.76	5.74
	(52.43)	(52.88)	(52.20)
R^2 (adjusted)	.362	.372	.364
F-ratio	34.2	29.4	28.4
S.E.E.	.341	.339	.341
Sample size	1,345	1,345	1,345

higher than the wages of men without formal training.* The values for other estimated coefficients are reasonable and in the expected directions. Craftsmen in construction earn 7 percent more than in manufacturing, blacks earn 7 percent less than whites, and craftsmen living in the South earn 16 percent less than those in the North. Craftsmen in large urban areas (SMSAs), on the other hand, earn 14 percent more than those not in urban areas. Each additional year of labor market experience confers about the same benefit for craftsmen as each year of firm-specific tenure, about a 1.6 percent increase in wages. Craftsmen with some college education earn about 10 percent more than high school graduates, whereas dropouts earn 11 percent less.

Economic benefits can also be measured according to various types of training: apprenticeship, company training (other than apprenticeship), military training, vocational education while in high school, training acquired in a business college, junior college, or technical institute, and all other training, the latter including government-sponsored training such as CETA.

If mutually exclusive patterns of training could be identified, the benefits attributed to training would be measured by estimating a linear regression model similar to the one shown in column 1 of table 10-12. Substituting for the variable, "any training," would be a series of variables, representing mutually exclusive patterns of training methods. The subsequent earnings that corresponded with each of these patterns would then be compared with the earnings of individuals who had no training. If training patterns were simple—for example if everyone had but one type of training—this approach would be straightforward. However, our examination of the data reveals a complex picture of training patterns that complicate the construction of a model to capture the benefit to training. The number of possible combinations of training methods is too large to enter directly into the model.

To simplify the problem, we show in the following diagrams the training patterns that are possible, focusing most specifically on two types of training: high school vocational education and apprenticeship. Our diagrams are constructed to show the economic effects of two different training strategies. In the first, a young man acquires one and only one kind of training and receives a wage differential for his training compared to a young man who has no training. Shown by line "a" in the diagrams, this will be labelled the direct effect of training on subsequent wages.

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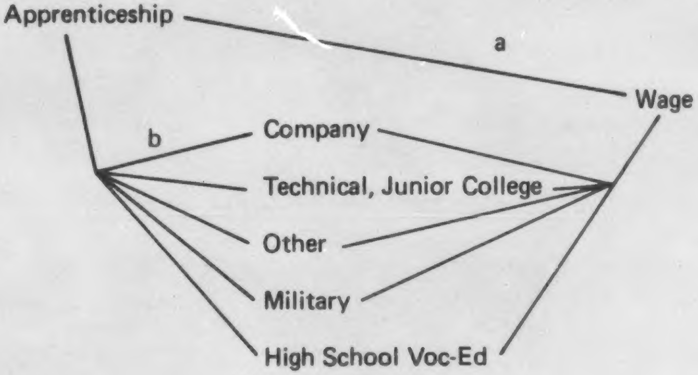
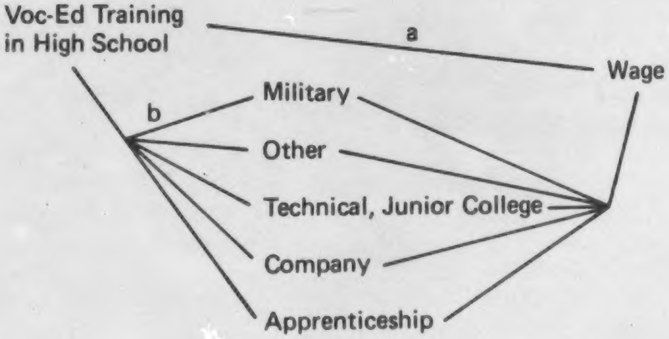
* This is calculated $e^{\beta} - 1$ where β is the estimated coefficient for the variable "any training" in table 10-12.





Large numbers of men do not take route "a" but rather combine either high school vocational training or apprenticeship with other training methods (route "b" in the diagrams, the indirect effect of a given training method on wages). We hypothesize that young men who take route "a" in either diagram will subsequently earn more than those who have no training. Furthermore, any of the routes "b" should result in even higher wages since we presume that the effects of training are cumulative.

Establishing a hierarchy of the various training possibilities results in a parsimonious set of variables to include in the regression model and isolates the combined effects of routes "a" and "b" for both apprenticeship and high school vocational education. In the first hierarchy shown as follows, any young man who had apprenticeship training is coded as an apprentice, regardless of whether he combined this training with some other kind:

Hierarchy 1

1. Apprentice
2. Company
3. Technical/Junior College
4. Other
5. Military
6. High School

When entered in the model, the apprenticeship variable from Hierarchy 1 will thus capture both the benefits accruing to route "a" and the benefits from any potential route through "b." The second variable in the hierarchy, company training, is attributed to a young man only if he did *not* couple it with apprenticeship training. If company training is coupled with any other form of training, however, these indirect effects are captured by the company training variable. Last in the hierarchy is high school vocational education. All indirect effects have been captured by the variables that preceded high school vocational education in our hierarchy, leaving only the direct effect through "a" to be measured. We expect the direct effect to be positive.

To obtain a measure of both routes "a" and "b" for vocational education, we reverse the hierarchy, placing vocational training first. Thus, anyone with high school vocational education is coded as having only high school training, regardless of whether this was combined with some other form of training. Placed last in Hierarchy 2 is apprenticeship training so that its direct effect can be measured alone. By comparing the estimates derived from Hierarchies 1 and 2, we can measure the added impact of multiple sources of training.*

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* For example, Hierarchy 1 could show that apprenticeship yielded a net wage advantage of 15 percent compared to men with no training. From Hierarchy 2, apprenticeships might show only a 10 percent wage advantage. Hierarchy 1 includes effects of both training routes "a" and "b," whereas Hierarchy 2 measures the effect of route "a" alone. Thus, the combination of training patterns represented by route "b" adds about 5 percent to the net wage advantage in our example. These types of comparison are appropriate for vocational education and apprenticeship since their position-

The benefits to training by type (table 10-12, column 2) reveal that apprenticeship nets a high wage advantage, 21 percent. The next highest benefit is only 8 percent, attributed to military training.[†] Even when considering only its direct effects, high school vocational training yielded a net wage advantage of 7 percent, though the estimate was not as strongly significant as were those for company training and apprenticeship.

By including the indirect effects of high school training (Hierarchy 2) we found that the wage advantage relative to those with no training rose to 9 percent (table 10-12, column 3). Estimates based on Hierarchy 2 also raised the value and significance level for training that occurred in technical institutes, for other training, and for company training. Correspondingly, the value of apprenticeship training fell when it was not coupled with other forms of training, from 21 percent to 17 percent.

Previous studies have not consistently demonstrated a significant return to vocational training in high school. Certainly, measuring the returns to training for craftsmen provides a good test since the occupation requires many of the skills taught in vocational education programs.[‡] Recall that our sample is comprised of individuals who were craftsmen and that we excluded any effect that training may or may not have on mobility from crafts jobs to others. Also, the hierarchical ordering of training by type captures both direct and indirect effects of training, whose influence often operates through multiple sources. With this methodology, high school vocational training shows a positive return of from 7 to 9 percent when compared with informal training.

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ing in the two hierarchies permits netting out the effects of routes "a" and "b." Our methodology does, however, complicate the interpretation of the amount of extra benefit attributed to combinations of training occurring through route "b." The extra 5 percent is a weighted average of all the possible training combinations. The weighting derives from the number of respondents taking various routes through "b," each of which has its own benefit. Thus, the exact additional benefit associated with all routes through "b" is affected by the composition of the sample.

[†] The estimate for military training, however, omits the wage benefit that occurs when combining military training with any training method other than high school vocational education. Thus, the 8 percent is not the full wage benefit that could be attributed to military training.

[‡] See, for example, John T. Grasso, "The Contributions of Vocational Education, Training, and Work Experience to the Early Career Achievements of Young Men." Ph.D. dissertation, The Ohio State University, 1975. One should note that by restricting the sample to craftsmen, we create the most liberal test for returns to vocational education training. The lowest quality workers who took vocational education but were not successful in gaining a crafts position are excluded.

The benefits to formal training may be confounded by interactions with race and industry. The construction industry, with its long tradition of unionization and control over wages through apprenticeships, presents a potentially different case for measuring the wage advantage due to training. Conceivably, in this industry positive returns may stem solely from apprenticeship, an institutionalized form of informal on-the-job training. Our data do not completely support this view. Certainly apprenticeship training in construction produces high benefits, 49 percent when compared to no formal training (table 10-13).* But even after accounting for apprenticeship training, men with training only in high school still showed higher wages than men trained informally, 15 percent higher.

In many ways, the construction industry represents a case in which jobs and training for those jobs are *not* highly intertwined. Substantial numbers of men with apprenticeship training never become craftsmen. Training received in technical institutes or high school, though by no means a perfect substitute for apprenticeships, does yield positive benefits. On the other hand, disproportionate numbers of individuals enter the industry with only informal training. What is unclear is whether they arrive with skills learned elsewhere or learn solely on the job. Without doubt they suffer a financial penalty for their lack of formal training.

Industries other than construction show quite a different picture. Training has positive benefits, but the 5 percent shown in table 10-14 is far less than the 26 percent estimate we obtained for construction. Apprenticeship and company training may be the only significant types of training, unless the indirect effects of training in high school or in technical school are incorporated in the estimates for these two sources. In contrast to these training measures, wage benefits associated with formal education are highly significant: in general, having some college training increases earnings 7 percent, and high school dropouts suffer a 12 percent penalty compared to graduates. These findings contrast with those for the construction industry, where dropouts on the average had no different earnings than graduates. In industries other than construction, education could be serving as a screening device for potential craftsmen.

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*This high wage advantage implicitly includes the effect of unionization, a variable that is not included in these regressions. The union variable is available in the NLS but only for employed men in selected years. When estimating the equations on a subsample of men for whom union status is known, we found that the return to apprenticeship training fell to 20 percent for men who worked in unionized construction industry jobs.

TABLE 10-13

Partial Results of OLS Estimated Wage Equations for Craftsmen in Construction

Dependent Variable: Ln of Hourly Rate of Pay in 1976 Dollars
(t-values)

Independent variables	*Column 1*	*Column 2*	*Column 3*
Any training	.238		
	(5.58)		
Training hierarchy 1			
Apprentice training		.402	
		(7.35)	
Company training		.089	
		(0.82)	
Technical institute training		.184	
		(2.27)	
Other civilian training		.105	
		(1.50)	
Military training		.165	
		(1.51)	
High school training		.143	
		(1.76)	
Training hierarchy 2			
High school training			.202
			(3.22)
Military training			.095
			(1.02)
Other civilian training			.190
			(2.84)
Technical institute training			.303
			(4.07)
Company training			.209
			(1.87)
Apprentice training			.403
			(4.74)
Black	-.119	-.119	-.106
	(-1.91)	(-1.97)	(-1.70)
Dropout	-.079	-.055	-.076
	(-1.48)	(-1.04)	(-1.42)
High school graduate	—	—	—
Attended college	.157	.141	.128
	(2.84)	(2.60)	(2.29)
R^2 (adjusted)	.362	.390	.369
F-ratio	11.52	10.58	9.74
Standard error of estimation	.389	.380	.387
Sample size	390	390	390

TABLE 10-14

Partial Results of OLS Estimated Wage Equations for Craftsmen in Nonconstruction Industries

Dependent Variable: Ln of Hourly Rate of Pay in 1976 Dollars (t-values)

Independent variables	*Column 1*	*Column 2*	*Column 3*
Any training	.052 (2.34)		
Training hierarchy 1			
Apprentice training		.100 (3.18)	
Company training		.064 (1.97)	
Technical institute training		-.009 (-0.22)	
Other civilian training		.011 (0.31)	
Military training		.056 (1.09)	
High school training		.042 (0.99)	
Training hierarchy 2			
High school training			.054 (1.80)
Military training			.053 (1.25)
Other civilian training			.012 (0.34)
Technical institute training			.077 (1.72)
Company training			.080 (2.17)
Apprentice training			.043 (0.87)
Black	-.056 (-1.99)	-.053 (-1.88)	-.056 (-1.97)
Dropout	-.112 (-4.26)	-.109 (-4.12)	-.109 (-4.08)
High school graduate	—	—	—
Attended college	.070 (2.40)	.070 (2.40)	.068 (2.32)
R^2 (adjusted)	.374	.376	.372
F-ratio	26.91	22.29	21.98
S.E.E.	.314	.313	.314
Sample size	955	955	955

An even more likely screening characteristic is race. Does training differentially affect success *among* blacks or is the influence of race so pervasive that little differentiation is observed once race is controlled? Among blacks training does influence wage outcomes, yielding a 10 percent wage advantage for blacks with formal training (table 10-15). Apprenticeship training does not show a significant return for blacks. White apprentices, on the other hand, showed a strongly significant wage differential over men with no formal training. The result stems from our inability to determine whether or not apprentices completed their training. For a subgroup of black respondents whose completion status is known, the benefit to apprenticeship training is strongly significant and shows a wage advantage that is as great or greater than that received by whites.* High school vocational education programs also yield a significant wage advantage for blacks (table 10-15, column 2), but for whites, high school vocational education was significant only if its indirect effects were included in the estimates.†

Blacks, then, have been able to alter the mix of training sources to compensate partially for their severe disadvantage in apprenticeships. Our earlier descriptive statistics showed a much heavier reliance on high school or technical school training among blacks than among whites. The pattern suggests strong discrimination and some adjustment from blacks to the rationing of apprenticeship training slots.

Thus far little mention has been made of union status; regressions have been estimated excluding a union status variable. We have implicitly assumed that one of the benefits of training is to enhance the probability that a job will be secured in the higher-paying unionized sectors of the

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* The sample consists of 219 blacks who were still craftsmen as of 1978. In the 1978 interview, respondents were asked if they had attained journeyman status following completion of an apprenticeship program. The regression results are available from the author on request.

† Regressions for blacks depart from the pattern we observed earlier in estimating wage models for other subgroups. The coefficient for high school training is stronger when only the direct effect is measured than it is when indirect effects are also included. Blacks who have multiple sources of training apparently experience a lesser return to their training than blacks who have only training in high school. This effect is plausible if blacks who are faced with employment difficulties enroll in multiple sources of training as a means of obtaining transfer income during periods of joblessness. In such a case the additional periods of training need not result in returns that are any higher than for blacks with only one source of training and subsequent employment success.

TABLE 10-15

Partial Results of OLS Estimated Wage Equations for Black Craftsmen
Dependent Variable: Ln of Hourly Rate of Pay in 1976 Dollars
(t-values)

Independent variables	*Column 1*	*Column 2*	*Column 3*
Any training	.095 (2.57)		
Training hierarchy 1			
Apprentice training		.081 (1.34)	
Company training		.121 (1.93)	
Technical institute training		.077 (1.04)	
Other civilian training		.037 (0.59)	
Military training		.171 (1.79)	
High school training		.143 (2.11)	
Training hierarchy 2			
High school training			.081 (1.57)
Military training			.201 (2.05)
Other civilian training			.071 (1.22)
Technical institute training			.069 (0.83)
Company training			.127 (1.72)
Apprentice training			.107 (1.33)
Dropout	-.068 (-1.64)	-.065 (-1.53)	-.070 (-1.64)
High school graduate	—	—	—
Attended college	.124 (1.99)	.121 (1.92)	.118 (1.87)
Construction	.037 (0.74)	.034 (0.66)	.035 (0.70)
Manufacturing	—	—	—
Other industries	-.134 (-3.18)	-.140 (-3.28)	-.133 (-3.13)
R^2 (adjusted)	.328	.324	.322
F-ratio	8.55	7.02	6.97
S.E.E.	.324	.325	.326
Sample size	341	341	341

crafts. But once union status is accounted for, does formal training further differentiate individual success? Not so, according to estimated equations for a subset of union and nonunion craftsmen. Only apprenticeship, and, to a lesser degree, company training have an impact on wages once union status is controlled (table 10-16). This result is the same for blacks as for whites, and for construction as well as nonconstruction industries. The value of other forms of training (such as high school vocational education) appears to come *through* an enhanced access to unionized jobs. Within the union or nonunion sectors of the crafts, training has little measurable impact.

SUMMARY INTERPRETATION OF THE DATA

Even in crafts occupations, a substantial proportion of young men obtain their skills through informal methods. Their participation in skilled manual training programs is certainly much greater than among those who do not become craftsmen; nevertheless, more than 40 percent in crafts positions did not report such training. An additional 30 percent of the young men received training either through apprenticeship or company training, i.e., tied directly to the jobs they held; relatively few obtained training independent of work experience. Lester Thurow cites such evidence to support his view that skills are acquired for the most part on the job. According to Thurow, labor markets do not clear through wage reductions or shifts in relative wages: rather, employers ration training slots based on worker qualifications. Therefore, understanding the process by which workers obtain their qualifications is an important step in the sociology of wage determination:

> Upon examination, the basic assumptions about the labor market seem less than adequate. They ignore long-run employer–employee interests in a good mutual relationship.
>
> They ignore the fact that much of our human capital is acquired on the job rather than in formal education. This can be seen in the analysis of the determinants of earnings or in the surveys of where working skills are acquired. The labor market is not primarily a market for allocating skills but a market for allocating training slots. Workers are only trained when job openings exist and an independent supply curve does not exist. But without independent supply and demand curves, wages must be determined in some fashion other than by a market correction. . . .

TABLE 10-16

Partial Results of OLS Estimated Wage Equations for Subsample of Craftsmen for Whom Union Status Is Known

Dependent Variable: Ln of Hourly Rate of Pay in 1976 Dollars (t-values)

Independent variables	*Column 1*	*Column 2*	*Column 3*
Union member	.300	.287	.296
	(12.59)	(12.25)	(12.58)
Any training	.032		
	(1.42)		
Training hierarchy 1			
Apprentice training		.100	
		(3.36)	
Company training		.052	
		(1.52)	
Technical institute training		-.011	
		(-0.27)	
Other civilian training		-.029	
		(-0.81)	
Military training		-.015	
		(-0.27)	
High school training		-.006	
		(-0.15)	
Training hierarchy 2			
High school training			-.002
			(-0.07)
Military training			.011
			(0.26)
Other civilian training			.018
			(0.50)
Technical institute training			.043
			(1.08)
Company training			.065
			(1.71)
Apprentice training			.120
			(2.57)
Black	-.099	-.093	-.101
	(-3.30)	(-3.09)	(-3.34)
Dropout	-.067	-.056	-.065
	(-2.53)	(-2.10)	(-2.43)
High school graduate	—	—	—
Attended college	.088	.090	.084
	(2.99)	(3.04)	(2.81)
R^2 (adjusted)	.487	.493	.488
F-ratio	45.14	36.86	36.17
S.E.E.	.306	.304	.305
Sample size	883	883	883

> Because skills are acquired on the job, in an informal process of one worker training another, every industrial operation needs workers willing to be trainers. To promote training and make workers willing to be trainers of other workers, employers essentially offer two guarantees. First, they promise not to lower wages if surplus workers become available. Second, they promise to hire and fire based on seniority. This means each trainer's trainees will be fired before he is. . . .
>
> Wages are set in a social process that is far removed from simple supply and demand curves in a modern industrial economy. From the employer's perspective this process is inefficient in that he cannot adjust wages to individual productivities and short-run changes in circumstances, but it is efficient since his production team is not disrupted by dissatisfied workers, and since training occurs at less cost than it would otherwise. The gains from rigid wages are greater than the gains from flexible wages.
>
> With downward rigidity in money wages and fixed relative wages, labor markets cannot clear via wage reductions and shifts in relative wages. They clear based on worker qualifications (level of education and so forth). (Thurow 1980, pp. 56-58)

The analysis of differences between blacks and whites demonstrates the importance of the social process of wage determination for the crafts. More black craftsmen than white were trained informally, and even among those with formal training the sources differed by race. Blacks were less apt to have apprenticeship or other formal training offered through an employer. Instead, they relied more heavily on high school vocational education and government-sponsored training to acquire their skills. Apprenticeship training yielded a high wage advantage for whites, but was not significant for blacks.

Military training can compensate for economic disadvantage in the social process of determining wages, but the link between training in the military and its utilization in the skilled crafts in the late 1960s and early 1970s was not strong, particularly for blacks. Our results could be of particular value as a benchmark for evaluating whether the transfer of military training to the civilian sector is now more effective.

Complicated patterns of skill acquisition reflect the complexity of social forces and individual choices that determine whether a young man is adequately trained for his craft. As a consequence, a model that measures the wage differentials associated with various kinds of training is also complex. Our modeling of the cumulative effects of training yielded significant results for high school vocational training. If coupled with any of the other training possibilities, young men gained a 9 percent subsequent wage advantage in the crafts jobs they held. Men who enrolled only in high school vocational education programs, on the other hand, gained only a 7 percent subsequent wage advantage.

The rules of the wage determination process gain special significance when analyzing the benefits to training. A reanalysis of wage differentials in unionized and nonunionized settings shows that once union status is held constant, training other than company or apprenticeship no longer explains wage differentials in either sector. When unionization is controlled, the wage rates of craftsmen are more strongly related to the level of formal education than they are to vocational training acquired through schools.

Informal skills acquisition, which for many accompanies the process of wage determination stressed by Thurow, is the most intangible method of training examined here. Informal methods occur more predominately in construction and are more heavily relied upon by blacks. Characterizing the informal methods was difficult, however, despite the rich file of longitudinal data we used. We found some evidence that skills were acquired in farming or previous technical jobs, but on the whole few clues were produced to specify the sources of informal training. Regardless of how the skills were acquired, our analysis confirms the quite different wage outcomes associated with informal versus formal training routes. Formal training yields a substantial wage benefit for those who obtain it.

Policy implications of the social processes affecting wages include continued support for training methods that compensate for blacks' low participation in apprenticeship programs. More attention should be paid to the manufacturing sector where blacks' disproportionately low utilization of apprenticeship was not compensated by higher rates of participation offered through vocational education or other sources such as government programs.

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WILLIAM SPRING

11

The Apprenticeship System—Reactor Comments

The apprenticeship system, neglected by policymakers during the years of greatest growth in federal funding for employment and training, now requires a closer look.

Industry testimony before Congress about skill shortages in the machine trades and other crafts, the sharp cutback in federal funding for employment and training, and a renewed interest in ways to build public-private partnerships all point toward the need to examine our oldest formal system that combines training with private sector employment.

The first annual Policy Forum on Employability Development of the National Center for Research in Vocational Education is to be praised for looking at the strengths of apprenticeship programs and the contributions they can make in preparing disadvantaged youth for "the world of work."

In reacting to the papers by Mr. Glover and Mr. Hills, I will first summarize their content, then raise some questions for further research and policy considerations.

ROBERT GLOVER'S "APPRENTICESHIP IN THE UNITED STATES"

In 1979, in a labor force of almost 100 million, only 12.8 million workers were classified as craftsmen. There were 285,000 people serving in registered apprenticeships. In the ten years from 1969 to 1979 those completing apprenticeships averaged only 19 percent of the *growth* of craftsmen's jobs. Since the turnover from retirement and other causes most nearly match the expansion of craftsmen jobs, it appears that apprenticeship completers fill perhaps as few as 10 percent of the craftsmen positions.

There are about 735 crafts recognized as apprenticeable by state and federal authorities. But half have no apprentices registered at this time. Most apprentices are concentrated in the construction (60 percent) and the machine (12 percent) trades.

The federal presence is small in apprenticeship training. The Bureau of Apprenticeship and Training (BAT) under the terms of the 1937 Fitzgerald Act is largely responsible for certification and monitoring of programs.

Apprenticeships are paid jobs at wages that increase over the time of the apprenticeship until the completer is earning prevailing industry wages. The training is largely on-the-job, but at least 144 hours of related classroom instructions are required each year.

In 1979, there were 50,700 separate apprenticeship programs, most very small, 85 percent of which were in single firms with no formal union involvement. The 14 percent of the programs jointly sponsored by unions and employers have fully 85 percent of the apprentices.

Progress has been made through affirmative action. From 1960 to 1979 minority participation in federally registered programs has increased from 2.2 percent to 18 percent, and female participation is up from 0.8 percent in 1973 to 5 percent in 1981.

BAT does not keep data on either age or economic status. California does keep age records that show only 20 percent of apprentices are under twenty years of age. Thirty-eight percent are over twenty-five years of age. Glover documents that the formal apprenticeship system trains only a small share of those workers who become craftsmen. Although it includes a vast array of occupations, the system is of importance largely in construction and the metal trades.

The German and Austrian pattern, to which Glover compares this system, seems to have little in common with American experience besides the word "apprentice." The American system is highly selective of candidates, and is concentrated in a few occupations. The European programs are nearly universal in both the participants and occupations they encompass, and are an extension of secondary education.

If our apprenticeship programs were of comparable scope they would enroll 7 million instead of about 300,000 people. Glover sees little hope of expanding American apprenticeship to resemble European patterns or to make the system more helpful to the disadvantaged American young person.

STEPHEN M. HILLS' "HOW CRAFTSMEN LEARN THEIR SKILLS: A LONGITUDINAL ANALYSIS"

Glover reports that the number of people completing registered apprenticeship programs never averaged more than 19 percent of the growth in the ranks of craftsmen. So, one might well ask how, in fact, craftsmen are trained.

Stephen M. Hills tries to answer that question. He has selected a sample of 1,525 men from among the 5,000 in the National Longitudinal Survey (NLS). All in the survey were interviewed nine times between 1966 and 1977. Those who Hills selected had worked in one of the jobs classified as "craftsmen and kindred workers" at some time during the period. The average age of the Hills' sample was twenty-six. All but 373 were white, and 70 percent were high school graduates.

Hills' most significant finding, perhaps, is that only 10 percent of the whites and 8.9 percent of the blacks reported *any* formal apprenticeship training, figures that square with Glover's findings. For whites, military training (17 percent), company training (16.4 percent), business college or technical institute (15.3 percent), and other civilian (15 percent) were all more frequently reported than apprenticeship.

Even more surprising is that only 52 percent of the blacks and 57 percent of the whites reported *formal* training of any kind (table 10-3).

In 1963, a BLS survey of craftsmen found that practically no one had received federally funded training. The NLS sample reported 15 percent of whites and 19.8 percent of blacks reported "other civilian" training. For blacks this category, which includes federally funded training, was second only to high school (21 percent) as a source of training. Company training increased from 7.5 percent in 1963 to 16.4 percent for whites in the Hills' sample.

The informality of the skills acquisition process is underlined by the experience of craftsmen in construction and manufacturing, the two industrial sectors with the highest concentration of joint apprenticeship programs. In construction only 20.9 percent of whites had had apprenticeship training. In manufacturing the comparable figure was 21.6 percent (table 10-5).

There are exceptions. Seventy percent of linemen and electricians were reported as having formal training experience; and plumbers, machine operators, and metal workers were in the 60 and 70 percent range. Of the black linemen, 83.3 percent had formal training, but there were only seven in the sample (table 10-6).

Hills asks several questions about black experience. The answers are not encouraging. For instance, blacks received only a little less training in the military than whites (18 percent versus 25 percent). However, 20 percent of the whites found a civilian job related to their military training, whereas only 4 percent of the blacks were as fortunate. Black opportunities to receive apprenticeship training are much more restricted than for whites, and half the blacks compared to 40 percent of the whites failed to find a craftsman's job.

From Hills' sample, the most promising route to a craftsman's job for a black lies through junior or community college training (82.5 percent of those who had such training found work as craftsmen). But the validity of this is somewhat suspect. Of the 373 blacks in the sample, only 23 reported their having such training.

If only 10 percent of those holding craftsmen's jobs were trained in apprenticeship and only about another 10 percent in company training programs, does formal training have any advantage?

Yes, about a 10 percent income advantage overall, according to Hills, and even controlling for union membership, apprenticeship in construction training is worth a 20 percent income advantage, except for blacks! In other trades, controlling for union membership, the return is 5 percent or less, Hills says.

Union status, according to Hills, is *the* key to better paying jobs. Once you control for union membership, of all training services, only apprenticeship and company training make any difference (table 10-16).

Hills' major finding is that informal, on-the-job training is the main source of skilled manual labor in the American economy. He quotes with approval several paragraphs from Lester Thurow's *Zero-Sum Society* in which the author explains why the market for labor is not like other markets.

Thurow says that employers agree to wage scales that are based largely on seniority and are rigid downward. Such a wage structure is crucial to keeping current workers happy in their roles as instructors of the newly hired. But this means that there are no classic workers for labor in which price changes lead to an equilibrium between supply and demand. Instead the quantity of jobs is determined by the demand for final products, not the wages people are willing to work for. And, jobs are rationed not on a wage basis but on the quality of the applicants.

Both these papers raise fascinating questions, but they draw so broad a picture of the apprenticeship system in the United States that the answers must await further research. Among the questions are the following:

- With such an informal system, how did the United States seize and hold international productivity leadership for so many years? Is it really true that a formal system for introducing young people to the world of work is a key to national productivity?
- What is the relationship between the classification "craftsmen and kindred workers" and the "apprenticeable trades"? Do craftsmen's jobs take the equivalent of a year's instruction on the job to learn, or are the points made in these papers somewhat weakened by the inclusion of many less skilled occupations in the "craftsmen" category?
- Hills' category of "other civilian" is a frustrating one for people concerned with federal employment and training programs. Are all these programs MDTA and CETA programs or are there other elements? Evaluation of past policies to help the disadvantaged requires much more detailed analysis of program results.

- What was the experience that made it possible for blacks to reach union jobs? Did the federally funded outreach programs make a difference? How much? Which programs?

Mr. Glover alludes to the following innovative programs that deserve greater attention:

- The Carpenters Performance Evaluated Training System (PETS) that provides a way to break the old time-in-grade lockstep, and introduces state-of-the-art curriculum sounds promising. Can it be more widely applied? Why did it take hold among the carpenters?
- Industry-wide trust funds to provide support for curriculum, teacher training, and equipment (such as mobile vans for rural areas) sound very promising. What led to such cooperation in the sheet metal and three other industries? Can it be duplicated in other industries? Is there a role for federal or state policy?

POLICY CONSIDERATIONS

First, it is clear that whereas affirmative action has led to somewhat greater access to apprenticeships for minorities and women, the effort must be continued and expanded to include craftsmen hiring if we are to make real progress. If such a large share of craftsmen are trained outside the apprenticeship system, perhaps employment and training programs seeking to correct past exclusionary practices should concentrate outside the apprenticeship system as well.

Second, as with affirmative action efforts, help for the disadvantaged must look for structures other than formal apprenticeships. There is opportunity in the stated need.

Beatrice Reubens, as quoted by Glover, states that the key elements in apprenticeship-type programs are the following: they are industry based, combine training and paid employment, and lead to portable certification. As Glover points out, all these elements have a special appeal to young people from poor homes for whom formal schooling has been a disappointment.

As long as apprenticeship programs are steps to the most highly paid manual jobs in the economy, the qualification-based competition will force most disadvantaged young people, including a disproportionate share of minority young people, to one side.

Some would argue that a youth subminimum wage would be a substantial help for the disadvantaged who, it is presumed, would be willing to work for less. However, as Thurow points out, for jobs with any skill content, our labor markets do not operate to any great extent by changing wage rates. The wages are set. The question is, who is best qualified among the applicants? And it is their lack of qualification that sets the disadvantaged so sharply apart in the minds of employers. A youth subminimum would have the effect of lowering wages in utterly unskilled jobs—upon which many very poor family heads depend for a livelihood—rather than opening up skilled training opportunities for the poor. What might make more sense would be a lower entry-level wage for beginners in higher-skill job categories where company-paid-for training is expected. But how such a system might be regulated leads us back to European models.

The advantage—in terms of helping the disadvantaged and minorities—of a Germanic system, if I may so classify the German-Swiss-Austrian approach, is that substituting a social structure for the play of the market provides opportunity to ensure not only lower unemployment rates for youth, but also to secure training for *all* youth, including the disadvantaged. These goals are attractive to me. It is not clear that they are attractive enough to our industries to lead American employers to forsake the informal system that Hills documents so convincingly.

There is another European model that Glover does not mention that may be worthy of serious consideration. The Grant-Levy program in Ireland is popular with employer groups. It is also used in England extensively. Under the program, industry boards (electricity supply, air transport, hotel and catering, and so forth), including labor and government representatives, set up under national legislation, tax firms (the levy) and return the funds to those firms who conduct board-approved training programs (the grant).

The advantages in the current American context are that the program is largely private in direction and in funding, it ensures fairness in allocating costs among industry employers, and it escapes to some degree the rigidities of current apprenticeship programs. And it might be tried first in those American industries which acknowledge a skilled-manual-worker shortage or fear a shortage in the coming years. And by moving from a competitive market to a structured system, would this provide opportunity for filtering the disadvantaged and minorities into training opportunities that they would be unlikely to win on their own?

Perhaps the key to understanding the informal American system is noting the ample supply of labor available to our employers since World War II, in sharp contrast to the severe shortages experienced in most European nations. It is possible that the sharp decline of new entrants into the labor market, in the next year, may lead to more opportunities for the disadvantaged. But the experience of the late 1960s would indicate that unless we build training ladders for them, the disadvantaged will still be left out.

So now, at the beginning of this decade, it is timely for the National Center and other organizations concerned with the country's employment and training system, and with economic justice for the poor, to take a close look, not only at the American apprenticeship system, but also at other methods of organizing private-sector involvement and financial support for the training of skilled workers.

These papers document just how chaotic the entry into skilled jobs is in the United States at this time. Sheltering beginning workers from the harshest winds of the market by including their early skills training as part of the nation's education or human-investment effort is our best hope for giving all our citizens a chance at the starting line.

The Vocational Education System

RUPERT N. EVANS

12

Public Secondary and Postsecondary Vocational Education

HISTORICAL ORIGINS AND SIGNIFICANT EVENTS

Precursors of the Smith-Hughes Act

It is usually said that vocational education in the United States began with the passage of the Smith-Hughes Act in 1917. But this statement is not accurate, even if we accept the usual view that (a) Vocational Education (with initial capital letters) means vocational education which is supported by government, and that (b) vocational education (with or without initial capital letters) helps a person to succeed better in one occupation or group of occupations than in any other work.

President Abraham Lincoln signed the first act that supplied federal funds for the support of vocational education. The Morrill Act encouraged the states to create land-grant colleges to provide instruction in the "agricultural and mechanic arts." In the beginning, the instruction they provided was clearly below college level. Quickly, however, they moved from the instruction of mechanics to the development of engineers and scientists, thus illustrating the nearly universal tendency of educators to try to enhance their own status by "upgrading" the education they offer.

Other attempts to meet the needs of farmers and mechanics for education (and the needs of employers for skilled workers) included agricultural extension and manual training. The former still provides valuable service, but manual training became extinct because it tried to use a single educational program to provide training for each and every occupation. After the turn of the century, labor joined management in an effort to replace manual training with "real" vocational education.

As usual, some of the states began to act before Congress did. They recognized that 5 percent of students were graduating from high school, and that the curriculum was designed only to prepare middle- and upper-class students for college. They knew that the need of students and employers alike was for an education that prepared a broader spectrum of students for life. But World War I was on the horizon before the federal government moved to encourage vocational education in the high schools.

Beginnings of Vocational Education: 1917-1963

The Smith-Hughes Act encouraged three types of vocational education: agricultural education, home economics education, and trade and industrial education. The first two were designed primarily for rural boys and girls, respectively. The latter was aimed at urban boys who wanted employment in skilled industrial pursuits. This rigid division of vocational education into clusters of occupations persisted until 1963. Although distributive education, business and office education, health occupations, technical education, and vocational guidance were added to the original three, each group lobbied for its own funds and had little communication with the other specialties. Industrial arts, the successor to manual training, had no federal support. It expanded in the thriving junior high schools, but had little contact with vocational education despite its obvious provision of career exploratory functions.

In spite of their differences, industrial arts and the vocational specialties all emphasized individualized instruction in shops and laboratories that resembled work sites, and developed youth organizations that provided extracurricular instruction. During the latter part of this period, vocational education added cooperative education to its scope, which allowed students to learn on the job while continuing to study related instruction and general education in the school.

Although vocational education was sometimes rejected by academic teachers who saw it as a threat to general education, vocational educators usually cultivated ties with academic teachers and other groups outside their ranks. They insisted that their students spend approximately two-thirds of their secondary school time in general education classes. They organized local advisory committees representing business, industry, labor, and the general public. They provided instruction to apprentices. They organized classes for young adults. They worked with the employment service to locate jobs for their students. They worked night and day to train hundreds of thousands of workers for defense industries during World War II.

Indeed, there was only one major source of conflict during this forty-six-year period; vocational education was directed by law to serve only those "who could profit from the training offered." In practice, this meant that vocational educators selected the "best" students who applied for their programs. But upper- and middle-class students who were academically talented chose the college preparatory curriculum, and those who were not so talented chose the general curriculum. Vocational education was left with lower-class students, and the least able of these were rejected even by vocational teachers. During the latter part of the Great Depression, the U.S. Department of Labor began to establish National Youth Administration (NYA) schools to serve some of the students who were not being served by the public schools. These new, federal schools were seen as a threat to locally controlled public education, and were opposed strongly by both general and vocational educators. The onset of World War II provided an opportunity to kill the NYA schools, but the seeds of conflict between the U.S. Department of Labor and public education had been sown.

Vocational Education Unifies: 1963-1981

The recommendations of the prestigious Willis Commission on Vocational Education were adopted by Congress in 1963, one year after it had passed the Manpower Development and Training Act. As a result, vocational education started to change. Subject-matter differences began to be deemphasized, and vocational educators began to ask, "what are the goals of vocational education?" instead of "what are the goals of agricultural education?" The emphasis began to shift from efficiency and productivity to equity. Instead of asking only, "what are the needs of employers and organized labor," vocational educators began to ask, "what are the needs of students?" Evaluations of vocational education began to shift from "what is the percentage of placement of graduates in the occupation for which they were trained?" to "how well do former vocational students fare, compared to similar students who have not had vocational education?" Federal regulations began to be relaxed in favor of state and local control of vocational education.

But the most apparent changes grew from the bulge of high school-aged students and the continuing trend toward more postsecondary education. Teachers were in short supply, so less competent teachers (including vocational teachers) were hired. Postsecondary community colleges, technical institutes, and technical colleges within universities began to expand rapidly, and demanded vocational education funds that previously had gone to high schools. Area vocational schools were established, which deemphasized comprehensive high school programs.

In the 1970s, the federal government began to stress career education and to relax further many of its quality controls over vocational education. At the same time, it insisted, for the first time, that vocational classes work to lessen sex stereotyping and to include more handicapped and disadvantaged students. In the early 1970s Project TALENT made it clear that the great majority of high school dropouts came from the general curriculum (Combs and Cooley 1970), and sentiment began to build for deleting this curriculum in order to concentrate on the college preparatory and the vocational curricula.

The effects of these changes included the introduction of work-related education into the elementary school, the redefinition of work-related types of industrial arts as vocational education, and a broadening of the definition of vocational education and of its clientele (Evans 1981a). Many vocational classes were added and many of the old strictures about serving only those who were most acceptable in the labor market were removed. Although career education has received little federal support, its concepts have permeated elementary and high school textbooks and inservice training of teachers. This has led to more emphasis on occupational exploration and less on preparation for a particular occupation (Evans and Herr 1978).

Some of these changes were due to the same humanistic forces that changed MDTA to CETA. Others occurred because of the shortage of technically competent vocational teachers and because of the difficulties of finding jobs for the vastly increased numbers of high school graduates, most of whom lacked salable skills and had little knowledge of labor market mechanisms and of their own capabilities.

Perhaps the most far-reaching change began when vocational education lobbyists sought access to certain CETA funds. Congress mandated linkages between these two training programs, which previously had been entirely separate. Prime sponsors were told to contract with public vocational education, using a minimum of 22 percent of Title IV funds. To everyone's surprise, many prime sponsors spent much more of their money on these linkages than they were required to spend. Similarly, many state-level administrations of the two programs began to work together more effectively. These successes came in spite of opposition from diehards in both camps, and led to national interest in even tighter linkages between CETA and vocational education.

In the last two years there has been greater interest in productivity, and less interest in serving "hard-core" cases with whom no one seems to have had much success. "Creaming" is not as dirty a word as it was a decade ago. No one seems to be disturbed that high school dropout rates have been static or increasing for more than a decade. The goals of increasing efficiency and productivity are cited more and more frequently, and equity (except sex equity) is mentioned briefly or not at all.

DEMOGRAPHICS AND NUMBERS

Because of the very rapid decline in numbers of births beginning in 1961, it is clear that the nation faces an equally rapid decrease in the number of young workers for the next fifteen years. We have had changes in the number of births before: decreases from 1920 to 1935, increases to 1961, decreases to 1976, and increases since then. But the decline from 1961 (4.3 million births) to 1976 (3.1 million births) is the largest and most rapid change on record. Obviously, persons born in 1961 are now about twenty years old. Not so obviously, the changes in the numbers of births will bring major changes in the labor market. Only the Germans and Japanese, among major industrialized nations, have seen anything like the shortage of young workers that we are almost certain to face (Evans 1981b).

If we had not had, already, such a major expansion of the numbers of women who work for pay, we could rely on them to fill the gap. The situation is further complicated because the birthrate for white and for middle-class families decreased much more rapidly than for the population as a whole. Higher and higher proportions of young workers will be immigrants or from other disadvantaged backgrounds. Who will prepare them for work? Public vocational education is one obvious candidate.

Size and Diversity of Vocational Education

Five million adults and 12 million youth participate in vocational education each year taught by more than half a million instructors. About a third of these students get training that is classified as "occupational," whereas two-thirds receive consumer and homemaking, work orientation, or other "nonoccupational" instruction. Ninety percent of postsecondary, 60 percent of adult, and 30 percent of secondary school vocational education is occupational (National Institute of Education, 1980).

Slightly more than half of vocational education students are female, but the great majority of women are in clerical or health occupations or in consumer and homemaking programs. This has led to charges of sex stereotyping, and to the most complete anti-sex discrimination provisions of any federal law. Percentage gains toward equal enrollments of both sexes in all courses have been impressive, and the degree of sex stereotyping in vocational education appears to be lower than that on the job. But progress toward changing student attitudes regarding nontraditional jobs has been slow, and changes in actual numbers have not been great. One major reason may be that women who have been trained in nontraditional occupations have lower earnings than those prepared for traditional roles (Meyer 1981, table 4).

More than two thousand community colleges and technical institutes and five thousand high schools provide instruction in five or more different occupational fields (NIE 1980, p. VI-15). Nationwide, enrollments in secondary school vocational education conform remarkably to population statistics for race and ethnicity, though blacks are somewhat overrepresented in distributive education (NIE 1980, p. VI-20) and probably in occupational home economics. In certain communities, however, blacks are considerably overrepresented in courses such as welding, masonry, and agriculture, in accord with local labor market patterns. Nationally, blacks are markedly underrepresented in postsecondary technical courses, especially in programs that have strong mathematics prerequisites.

In secondary schools, vocational education tends to enroll students who are below average in socioeconomic status and verbal ability, whereas the college preparatory students are above average in both these measures (Evans and Galloway 1973). In postsecondary vocational education, however, one is likely to find students who are below average on one, but not both, of these measures. Those who are high on both tend to go to a university rather than to a community college, and those low on both often do not attend a postsecondary school (Evans, Cheney-Stern, and Handler 1976).

The age of secondary school vocational students in occupational courses has remained remarkably constant. Almost all are juniors or seniors, seventeen or eighteen years of age. However, the inclusion of career exploration courses in junior high school and early high school years has lowered the mean age more than it has been raised by the increasing numbers of cooperative education students who are seniors. The mean age of postsecondary vocational students has been going up steadily, and the mean age for all community college students is now above thirty-five.

It has long been the case that as unemployment rates increase, postsecondary vocational enrollments (of both full- and part-time students) also go up. Most economists regard this as highly desirable, since foregone earnings and instructional costs tend to decrease as economic activity diminishes. Secondary school vocational enrollments are not similarly tied to the level of economic activity. Instead, until the 1960s there tended to be a fixed percentage (traditionally 25 percent) of the total school graduates in vocational education. During the 1970s, however, this percentage more than doubled. NIE claims that during 1978, some 70 percent of secondary school students were enrolled in one or more vocational courses (NIE 1980, p. VI-3). This seems too high, probably because they forgot that junior high schools are also secondary schools. Nevertheless, probably more than 70 percent of the current high school graduates will have had one or more vocational courses. Daymont and Rumberger (see chapter 13, table 1) present a more convincing set of figures. They show that the average high school dropout has less than one unit of vocational education; the college preparatory student has 2.3; the general curriculum student has 3.2; and the vocational curriculum student has five units of vocational education courses (of a total of 15.8 units). Their data indicate that only the male college preparatory student is unlikely to take a vocational course in high school.

It would appear that part of this increase is due to the increased emphasis on career exploration, and part is explained by the increased willingness of vocational educators to allow single course enrollments, rather than insisting that the student complete all or none of a sequence of courses (commonly called a vocational program). However, the mixing of data about course and program enrollments is a major cause of difficulty in the interpretation of enrollment statistics.

FEATURES OF THE PUBLIC VOCATIONAL EDUCATION SYSTEM

Many lay persons think of vocational education as "Shop," but actually more than 150 different occupations are taught, and most of the trainees are not associated with shops or blue collars. However, Congress specified, long ago, that no vocational education funds can be spent on training for occupations that require a baccalaureate degree for entry. This restriction was enforced because Congress was aware of the natural bias of school boards and educators toward preparing everyone for the professions.

Congress also grouped the vocational education occupations into six categories: agriculture (e.g., floriculture, farm equipment repair), business and office (e.g., bookkeeping, word processor operation), distributive (e.g., retail sales, warehouse management), health (e.g., nursing, X-ray technician), home economics (e.g., homemaking, day-care aide), and trade and industrial (e.g., drafting, welding). Trade and industrial education covers training for all of the occupations that do not fit neatly into the other five categories. Congress also created the category of technical education, which includes the higher levels of each of the other six categories. Most technical education is taught in postsecondary schools.

The occupations that are taught are those for which a continuing enrollment can be expected. Schools cannot hire full-time teachers and buy equipment unless they foresee a demand. If students stop wanting to enroll, the equipment will be unused and tenured teachers might be underemployed. This desire to have only courses that will have enrollment year after year leads to a heavy emphasis on training for occupations in which turnover rates are high (e.g., typist and nurse). It also leads schools to be cautious about installing new programs for which continuing demand is speculative.

There are no required vocational education programs. If students (and their parents) do not believe that a particular vocational education class will help them get a job, they will not enroll (except in auto mechanics, for which there is an insatiable, non-job-related demand). This introduces a market mechanism that can lead to the retraining or firing of teachers, and often leads to the discontinuation of programs that are seen as obsolete or irrelevant. Conversely, if students cannot be persuaded to enroll, labor market studies that show a need will not be effective in causing schools to start new programs.

Competencies Taught

Manipulative skills (how to use your hands to control tools and equipment) are a part of most vocational education programs. The occupational field that is to be taught is analyzed, and those skills that are essential to success in that work are emphasized. Skills that are "nice to know" have low priority.

As work has become more and more complex, the content of vocational education has changed. More and more emphasis is placed on related knowledge from mathematics and science, which is needed for success and promotion on the job. Communications skills, including work vocabulary, are stressed both in class and in vocational youth organizations (Future Farmers of America, and similar groups for each of the vocational subject areas).

Attitudes toward work are not neglected. The reasons why employers and customers demand promptness, accuracy, politeness, and productivity are explained. The effects of absenteeism and tardiness are shown. More and more attention is given to the economics of work. But at the same time, students are taught how to work within the system to improve working conditions.

Career education has highlighted the need for knowledge of the world of work and for knowledge of personal interests and aptitudes that are related to work. Job-getting and job-holding skills, knowledge of career ladders and lattices, and awareness of the need for continuing education are also emphasized. Vocational education is much more successful in teaching job-holding skills than it is in the other parts of career education. This is due largely to the emphasis on teaching about only one segment of the world of work in each vocational program. Usually, vocational education is not structured in a way that encourages teaching about all of the world of work. In part this is due to congressional restrictions on teaching about the professions, but even more importantly, it is due to a theoretical division of labor between vocational and general education.

In theory, vocational education should be responsible for teaching only those things that enable a person to be more successful in one occupation or one group of occupations than in other occupations. Those things that are needed for success in all occupations should be a part of general education. To support this division of labor, and to foster the teaching and learning of important subjects that have no direct relevance to work, all vocational education is offered in conjunction with general education. In a high school, vocational students usually spend half to three-fourths of their time in general education classes. In postsecondary vocational education, full-time students usually devote a fourth of their time to general education. Programs for part-time adult vocational students are the one exception to the almost universal coupling of vocational and general education instruction. Part-time vocational students tend to pick and choose which courses they want, and often demand technical instruction that is delivered without requirements that the students consider irrelevant.

Unfortunately, in practice, "general" education is not really general (useful to everyone). Instead, it is heavily weighted toward preparing students for further education. Little attention is paid to the needs of those students who are preparing to leave school for work. This requires that vocational education include a major component of general education about work. This is why it emphasizes work values and attitudes and job-seeking skills. Unfortunately, not everything can be done in a one- or two-year program (270 to 720 clock hours) in the last two years of high school.

Similarly, vocational education must make certain that its graduates have sufficient basic education to succeed on the job. A typist who cannot spell is not apt to stay employed. The easiest way to solve this problem is to screen out those who want vocational education but who do not possess the necessary basic skills. Disadvantaged and limited-English-speaking students suffer from such screening, as do students with certain types of handicaps.

It is well known that highly motivated students learn much more rapidly. Many vocational students discover for the first time that the basic skills they have been avoiding are absolutely essential for the job they want. Because vocational education and general education are offered concurrently, they learn to read and compute rapidly. But if disadvantaged students are screened out of vocational education, or if relevant general education is not available to them although they recognize the need for it, they are apt to be permanently disadvantaged or to be candidates for postschool CETA programs. We need a current replication of the 1968 study that found that in Minnesota 88 percent of the MDTA trainees came from the high school general curriculum, whereas only 2 percent were graduates of vocational education programs (Pucel 1968).

PROCESSES USED IN VOCATIONAL EDUCATION

Vocational education can be designed to prepare one for success in a job, in an occupation, in a group of occupations, or in all of work. It can also provide vocational guidance. In practice, all of these are taught, but not necessarily to the same individual (Evans 1981a).

Job training is most often found in the type of vocational education that is designed to encourage short-term economic development. A particular employer needs workers on specific jobs, and vocational education trains them. Emphasis is on job performance, rather than on transferability of skills to other jobs with other employers.

Occupational training is designed to prepare people for a specific occupation, such as computer terminal operator. Many employers hire such operators to do similar work, so interemployer mobility is enhanced.

Training for groups of occupations is more and more common. Building trades is a vocational program that is less specific than occupational training for carpenters, but it teaches how one occupation relates to other occupations. In theory, it enhances mobility within an industry, but it can be so general that a person is not prepared for any entry-level occupation. Increasingly, training for a group of related occupations is done in high schools, followed by more specific training in postsecondary schools.

Employability training is actually general education. It teaches people how to find and hold jobs. It teaches the difference between jobs with a future and those that are a dead end. It teaches the relationships between personal interests and abilities and success in work. Vocational funds are used for employability training when general education funds have not provided general education about work. Employability training and vocational guidance usually precede or are offered concurrently with more specific vocational education, but they may stand alone, and may be enough for people who want semiskilled or unskilled jobs, or who seek jobs with large employers who traditionally have been expected to provide significant amounts of on-the-job training (OJT).

There are two, quite different designs for vocational education. The traditional method offers instruction in shops or laboratories that somewhat resemble the work setting. Its counterpart in industrial training is the vestibule school. The other method, cooperative education, uses OJT at the work site, but adds to it an occupation-related class that is taught in the school. Both methods offer concurrent general education (usually half-time in the secondary school and quarter-time in postsecondary programs).

Individual or group projects are the principal mode of instruction in the traditional method. Content of the projects is drawn from the occupational field, and skills are usually taught in order of difficulty. Occasionally a production setting is simulated. The flow of trainees is virtually independent of the economic cycle because it is determined by the number of students who desire the instruction and who can be accommodated.

Cooperative education (and clinical training in the health occupations) often cannot be arranged to provide a progression from simple to complex tasks, because the flow of work determines what can be taught. Particularly in large cities, the amount and type of cooperative education are affected adversely by poor economic conditions. In rural areas, employers seem to be more sensitive to human needs, so economic conditions must become extremely grave before cooperative trainees are laid off. Instead, the major problem is lack of a wide range of occupations from which students can choose.

The distinction between these two methods becomes blurred when in-school typing or print shops do production work. By choosing carefully which work they will do and when they will deliver it, they can have many of the advantages of cooperative education without some of its disadvantages. Instead, the main problem becomes relationships with local employers and workers who see the school doing work that they might do.

Both traditional and cooperative vocational education require classrooms and libraries. The laboratories pose the major problem for the traditional method. Employers and students are quick to perceive obsolete equipment, and schools rarely can afford to buy the latest and fastest equipment. This frequently causes real problems because students cannot learn new processes. A common solution is to arrange for donations of new equipment from manufacturers or from interested employers. Donations from employers are sometimes an embarrassment because they are more obsolete than existing equipment.

Often, however, the obsolescence is perceived but not real. Some processes have remained essentially unchanged for decades. New equipment may be faster and more powerful, but the processes to be learned are identical. Sometimes, the older equipment is better for instruction because it is less cluttered by gadgets and more open for inspection. Advisory committees are the best source of information about the extent to which new equipment is really needed.

LINKAGES

Advisory committees are used at the national, state, and local levels. Local committees are used primarily to establish linkages with the community and to guide the instructional program. National and state committees provide advice primarily on policy matters.

Local committees usually have equal representation from management and labor, with additional members chosen from the public. The most effective committees meet regularly, keep minutes, and their advice is usually heeded. Too frequently, advisory committees are used on an ad hoc basis, for example, to build support for a local tax increase. Vocational educators usually welcome advice, but local school boards and administrators often fear that their functions will be usurped by strong advisory committees. State advisory committees have recently been given a charge to provide technical assistance to local committees to enable them to function more effectively. It appears that most state committees have not yet given much technical service, but the potential value of such service is considerable.

Follow-up studies of employer satisfaction with former students (graduates and dropouts) and the job satisfaction of former students can improve instruction and course content. Follow-up studies also look at training received after graduation. About a third of the high school vocational graduates go on to further education. Male vocational graduates are more likely than comparable nonvocational students to receive company training and apprenticeships, and female graduates are more likely to be involved in continuing formal education than general graduates (Grasso and Shea 1979, p. 63).

Before the late 1950s there was a valuable linkage between vocational educators and joint apprenticeship councils because vocational education provided much of the related job training of apprentices. During the next twenty years many unions chose to set up their own schools (in some cases to avoid racial integration), but in many cases they are now renewing their ties with vocational education.

An increasing proportion of vocational graduates are becoming entrepreneurs, often after several years of experience as an employee. The presence of former graduates in the local business community provides excellent linkages for vocational education. Both they and former graduates who are employees often serve as instructors of part-time students.

With the exception of a few graduates of clerical programs, almost all former vocational students work in private industry. In part this is because of the content of vocational education, but it is also due to the strong ties between vocational education and the private sector. At one time these ties were principally with small businesses that could not afford to run their own training programs, but increasingly, large employers see vocational graduates as prime candidates for their own training programs.

As vocational education becomes more and more accustomed to working with CETA, linkages are being built with prime sponsors, private industry councils, and community-based organizations. The recent emphasis on serving the handicapped has brought more contacts with associations of the parents of such students.

Most of the linkages previously described have been improving, but there has been deterioration elsewhere. Government agencies (federal, regional, and state) have multiplied their demands for reports and compliance documents at the same time that they have been decreasing the relative amount they contribute to program operation. The technical assistance they once provided has decreased as their staffs have been cut. Naturally this does not help linkages.

Teacher training universities have had similar staff reductions, and they are less and less able to provide trained teachers to local vocational programs. Nearly enough teachers are trained, but most of them move to higher salaries in private industry before or shortly after they enter teaching. As is inevitable, the teacher training schools are held in less regard by local administrators.

Linkages with professional associations have also suffered. Inflation has increased dues and decreased services. Lobbying is not effective in providing enough funds for all of vocational education, so there is a tendency to form special interest groups that seek a larger proportion of a shrinking total.

Local independent (proprietary) occupational schools have usually suffered from competition with public vocational schools. In a few communities they have profited as public schools send students to private schools when they can provide instruction less expensively than public schools could. Competition has been particularly severe as both public and private schools compete for CETA training funds. It is difficult to maintain linkages with competitors.

One type of important linkage is often not considered: the linkage among public schools. Secondary and postsecondary schools compete bitterly for public funds in many states. In multischool districts, local schools alternate between anger and sycophancy toward central school district staffs as they seek funds from the same diminishing pot of money. Finally, area vocational secondary schools that depend on home schools for students (and sometimes for money) find that they are competing for a diminishing pool of students and resources. Many area schools are likely to die as the home schools on which they depend increasingly refuse to release students. The home schools want to keep students in order to provide employment to academic teachers who otherwise would be laid off as the number of students declines. It is as difficult to maintain linkages between competitors in the public as in the private sector.

INCOME, COSTS, AND STRUCTURE OF VOCATIONAL EDUCATION

Funds for vocational education come primarily from taxes, though tuition and fees provide major income from adult, part-time students. Less than one dollar of revenue comes from federal grants for each ten dollars of local and state funds. A decade ago, this ratio was 1 to 5. A few states spend substantial amounts on vocational education, but almost all of vocational education is paid for by local tax dollars.

Because the amount of state and federal funds per vocational student has been cut in half (in current dollars) in the last ten years, the program has been in a severe financial squeeze. This squeeze has been particularly difficult in the past five years, as local tax increases have become increasingly rare. Not only has the enrollment more than doubled, but inflation has hit vocational education programs as well as other parts of the schools.

There is little more that can be cut without curtailing the number of trainees. In the past ten years, more and more emphasis has been placed on relatively inexpensive classroom programs that do not require equipment and expensive supplies. The occupational part of vocational education has suffered severely and its quality should not be cut further.

Vocational education has been a lean and spare program. Payments to students for learning and payments for student rooms and meals are unknown. Total costs for adding vocational education to the school curriculum are slightly over a dollar per trainee hour, far lower than any other job training program. Of this added cost, the federal government contributes only about a dime per hour.

For many years a major additional problem was that the school year began with no definite indication of the amount of federal money that would be available. This was improved for a time by appropriations for a year in advance, but recently, both state and federal administrations have used recisions to cut budgets after the beginning of the school year. Because full-time teachers are usually on annual contracts, administrators somehow have to find funds to pay them. This has led to an increasing reliance on lower paid, part-time instructors who can be dismissed at any time. This adds flexibility, but erodes continuity. It is a truism that programs and curricula cannot be built with part-time staff.

ENROLLMENT

There were some 6 million secondary school and less than 1 million postsecondary school vocational education trainees in 1970. The former number is inflated by an unknown number of students who were counted twice because they enrolled in two vocational courses. The current numbers are 10 million and 2 million, respectively, with double counting essentially eliminated. In other words, enrollment has doubled in a decade.

Postsecondary enrollment has increased sharply in the last year, as unemployed or underemployed youth and adults have sought skills that are salable in a depressed labor market. The increase has been particularly great among college graduates in the humanities and in academic teacher education. It makes sense to them to go to community colleges to take a one- or two-year vocational program that leads to a good job, rather than to go on to graduate school or go on welfare.

In contrast, the high unemployment rate has had little effect on secondary school enrollments. The high school dropout rate has been static for a decade, and may even be increasing. The increase in secondary school vocational education enrollments has occurred because higher and higher proportions of students have been taking vocational classes. The effects of increases in youth unemployment rates on increases in enrollment are uncertain. Enrollment has gone up year after year regardless of the current state of the economy.

Secondary school enrollments will decline some 25 percent from 1977 to 1992 (unless the dropout rates are decreased), and there are not likely to be further major increases in the proportion of high school students taking vocational education courses (currently 70 percent). Consequently, we can expect moderate decreases in secondary school vocational education enrollments unless major steps are taken to retain youth in school. When they drop out, disadvantaged youth, in particular, are obvious candidates for CETA programs, which are far more expensive. If they stay in, they can use teachers and facilities that otherwise would be underutilized.

Postsecondary vocational education enrollments are likely to continue to increase, given the clear labor market advantage achieved by graduates. The rate of increase will almost certainly continue to be directly related to general unemployment figures.

GOALS AND POLICIES

In chronological order of their appearance, the four principal goals of vocational education are as follows:

a. Provide the skilled workers needed by society
b. Increase the work-related options of trainees
c. Increase the face validity of general education
d. Enable trainees to improve their working conditions

No other training system has all four of these goals. CETA emphasizes a, b, and d. Training in business, industry, and the military concentrates on the organization's own needs, rather than on society's needs for skilled workers, and b and d are incidental. Apprenticeship concentrates on the needs of the labor and management groups that control it, but it places strong emphasis on b and d. Proprietary schools emphasize a and b. Vocational education seeks to achieve goals a, b, and d because it is under public control and seeks the public good; it is able to achieve goal c because it links general education and specialized education. No other occupational training system seeks to enhance general education.

Policies to achieve these goals are affected by many groups, including school boards, state legislatures and Congress; the courts; local, state, and federal administrators; and by professional associations. Today, the most influential of these groups are at the local level, though the courts have also gained in power.

Most new policies continue to be proposed at the federal level but there are significant exceptions (e.g., state decisions to provide job training to lure employers from other states). Local decision makers choose which policies they intend to implement and the ways they intend to implement them. It is no longer feasible for the state to specify the minimum width of outside doors in agriculture education shops or for the federal government to determine the qualifications of state directors of vocational education.

At one time, when state and federal governments provided half or more of the funds and almost all of the technical assistance, they were far more influential than they are now. But the relative financial contributions of the parties involved are not the only factors in relative influence. The federal government decided many years ago that it would seek to maintain, improve, and expand vocational education. Maintenance means keeping the status quo. Expansion implies greater, not less, money and technical assistance. Only improvement suggests leadership to provide change for the better. Given the unlikelihood of substantially greater amounts of federal funding becoming available, this suggests that "maintenance" should be abandoned, that "expansion" should be tied to funds generated by expectations of productivity improvements, and that program "improvement" should be the principal focus of federal efforts and funding.

OUTCOMES AND EVALUATIONS

A wide variety of individuals and groups assess the intended and unintended outcomes of vocational education. All of the groups mentioned that formulate goals and policies also conduct more or less formal evaluations of the programs with which they are concerned. In addition, most of them also evaluate training programs that provide alternatives to vocational education. They do this to improve the programs of vocational education for which they have assumed responsibility, and they may do it to help to decide how to divide their resources among competing programs. Local school boards, for example, collect data and make judgments about:

the outcomes, assets, and liabilities of adding or deleting vocational courses or services; contracting with an area vocational school or a trade school (as opposed to offering a program of their own); or contracting with a CETA prime sponsor for receiving or delivering counseling, basic education, vocational training, or placement services. Congress arranges for evaluations to help decide allocations between CETA and vocational education, between secondary and postsecondary school programs, between programs for rich and poor students, and so forth.

Operators of competing programs also evaluate vocational education. Unfavorable evaluations may be publicized in order to gain comparative advantage. Favorable evaluations may be used to get ideas of ways to improve their own programs. Such competition often leads to improvement.

Professional critics may conduct evaluations of existing programs simply because they are there. Or, if they are convinced that our economic system is bad, they are likely to evaluate and criticize any program they see as shoring up capitalism.

The most important evaluations, however, are done by the users of the system. Employers decide whether to "make or buy" training, and if they decide to buy it, they decide where and when. They evaluate the performance of persons they have hired from a program in order to decide whether or not to hire more, or in order to make recommendations for improvement in the program. They evaluate the benefits of participating on advisory committees, and if they participate, they evaluate parts of the program before giving advice. Because employer evaluations have more impact at the local than at state or national levels, they concentrate on local evaluations. But they have no hesitation in advising state and national groups to which they belong of the results of their evaluations.

Trainees and their families are the other key users and evaluators of vocational education. There are no compulsory enrollments in vocational education. There are other routes to high school diplomas, associate degrees, and occupational licensure. Anyone who chooses to take a vocational course is likely to have weighed the merits of other actions, including staying home and watching television. Evaluations include reports from peers, observations of the success of neighbors, results of follow-up studies, and personal observation.

Users continue to evaluate vocational education after they go to work. Peng (1977, table 3) found that 87 percent of those who had had job training in high school felt that "training was a wise choice," and only 32 percent said, "Could have gotten my job without the training."

If users (employers and trainees) decide that vocational education is not worthwhile, they communicate their feelings, and the program begins to wither. Unless corrective action is taken soon, the program should rightfully die, allowing its competitors to gain the advantage. Instead, however, it is likely to admit lower and lower ability students. The quality of vocational education ranges from extremely good to unbelievably bad. Those programs that are rated as bad by their users become a "dumping ground" for students who do not have any better alternatives. This means that students who need the most help are likely to be rejected by excellent programs, and to be enrolled in poor programs that cannot give them the help that they need. But if a program continues to decline in quality, eventually it will have so few students that it will be forced to close.

Most evaluations by nonuser groups are suspect because they give insufficient weight to the needs of the poor, the disadvantaged, minorities, and the handicapped. Similarly, evaluations by vocational educators may be suspect because of self-interest. Probably the best evaluations come from free and open competition in the marketplace, continued over a long enough time to learn long-term effects, and to allow adaptations to meet competition. The disadvantaged trainee, however, needs protection from unfair competition, at least in the short run.

PRINCIPAL CRITICISMS

There are three principal criticisms of vocational education: low cost-effectiveness, production of docile workers, and causing a decrease in the time available for general education. The criticism that vocational education has low cost-effectiveness applies almost entirely to secondary school programs. The earnings of postsecondary graduates of vocational programs are so high that there is no question that these programs pay off handsomely. Secondary school programs, however, are only marginally cost-effective in producing increased earnings. There is no question that secondary school vocational graduates earn more per year (though they do not earn more per hour) than nonvocational students who have similar verbal skills and family background. When one takes into account foregone earnings and possible returns to alternative noneducational investments, however, it seems clear that secondary school vocational education is a good or a bad personal investment depending on the quality of the individual program.

Even within one high school there may be extremely good or bad programs. In some cases secondary school programs are not attuned to local labor market trends because a tenured teacher continues to teach skills that are no longer needed. In other cases, pay scales for teachers are so low (because they are geared to what must be paid to attract academic teachers who are in plentiful supply) that competent vocational staff cannot be employed.

It appears that societal investment in even poor-quality secondary school vocational education programs can sometimes be justified because these programs serve as an "aging vat" that keeps students out of trouble until they are old enough to be more responsible. Obviously, this should never be used as an excuse for failure to work for program improvement.

It has often been hypothesized that vocational education pays off in the short run but not in the long run. One would expect that seniority and OJT would wash out the effects of initial training. Hence, the wages of similarly talented individuals would become alike. Longitudinal studies are needed to test this hypothesis, but unfortunately there have been no such studies designed to evaluate vocational education. Project TALENT data collected during the 1960s indicated that high school trade and industrial graduates increased their earnings (both absolute and relative to general curriculum graduates) for at least six years (Eninger 1965, p. 36). Conroy (1980) found that five years after graduation, there was a correlation between annual earnings and the amount of vocational education taken in high school five to seven years earlier. Meyer (1981, table 1a) found similar results for seven years after graduation. The initial effects were strong for both women and men, but were especially high for women. At the end of seven years, however, the men were better off than the women. For men who had taken commercial courses, the earnings effects increased steadily, although for men in "trade and industrial arts" [sic], earnings stayed slightly, but steadily, above comparable groups for the second through the ninth year after graduation (Meyer 1981, graphs 1-4). It appears possible that obsolesence or deterioration of skills is counterbalanced by factors such as the opportunity to acquire further OJT or formal training from employers, and that men are more likely than women to have access to such further training.

A quite different type of criticism charges that vocational education (or all of education) is designed by capitalist masters to produce docile workers or to move white students ahead of minorities in the employment queue. There seems to be no evidence from the past forty years to support this criticism. Indeed, some of these same critics have charged that vocational education is designed for blacks, whereas the college preparatory curriculum is for whites. This latter charge has received little attention since data have become available on racial distribution within vocational education.

Finally, it is sometimes said that vocational education decreases the time available for general education. In some cases this is true, but on the other side of the ledger is the undoubted fact that vocational education provides considerable general education about work, and the probability that if vocational education were not offered, fewer students would be in contact with formal education at all. Other types of job training do not put students into general education concurrently with their training. Clearly vocational education brings home to many students the real utility of general education, often for the first time in their lives.

One is still left with the question of why the earnings of Eninger's trade and industrial graduates increased year after year during the 1960s, and the earnings of Meyer's "trade and industrial arts" graduates lost most of their initial advantage over comparable students from other curricula during the 1970s. Four possible reasons should be explored: (1) Eninger put industrial arts graduates in the general curriculum, whereas Meyer apparently classified all of them as vocational; (2) trade and industrial graduates of the 1960s had more vocational instruction than those of the 1970s; (3) the economy and the demography of the 1960s and the 1970s differed in ways that gave a greater comparative advantage to trade and industrial graduates during the former period; and (4) the rapid increase in the number of vocational industrial enrollments led to a decreased advantage for each new enrollee, as suggested by Alan Gustman. My guess is that each played a part, but that the latter is the most influential factor. The increased number not only increased the supply relative to demand, but also led to decreased standards for entry to the training program.

PRINCIPAL BENEFITS

Virtually every study of such programs shows that secondary school vocational education leads to three principal personal benefits: to decreased rates and length of unemployment; to decreased high school dropout rates; and to increased annual earnings. The principal societal benefits, in addition to the skills and attitudes that are learned, appear to be the decreased need for tax-supported employment and training services (Pucel 1968), and lower incarceration rates. In virtually every case, the benefits from postsecondary vocational education are even better than those from vocational education in the secondary school.

Another benefit is the fact that vocational education (particularly in postsecondary and adult programs) is countercyclical. OJT in business and industry virtually ceases when hiring and acquisition of new equipment stop, but vocational education expands when trainees have nothing else to do, and when instructors are more readily available.

Finally, among the various occupational training systems in this country, vocational education is second only to CETA in serving those who have been maltreated by other institutions of society.

TRENDS AND PROJECTIONS

Beyond a doubt we are entering a period of intense international competition in which the level of skills and productivity of the nation will be tested sorely. We will be handicapped by a shortage of young workers. This is likely to lead us to value young workers ("golden eggs" in Japan) more, and hence to lead them to value themselves more, particularly if they can be made more productive. Because of the shortage of young workers, we are likely to have more immigration and hence a major need to provide education about work to limited-English-speaking youth and adults.

Reindustrialization will require major efforts to retrain adults for new occupations. Further attention will need to be paid to persons who have not been served well by other training agencies, e.g., workers in sex-stereotyped occupations, mid-life career changers, inmates in correctional institutions, and handicapped workers.

MAJOR IMPEDIMENTS TO IMPROVEMENT

In spite of the impressive list of linkages mentioned, much needs to be done to make these linkages more frequent and more effective.

Most of the evaluations of vocational education have focused on the quality of the graduate, rather than on the amount of *gain* in trainee productivity and well-being. The value added by vocational education should be the primary concern, together with the cost per unit of value added.

Another major problem with most evaluations is that they focus on placement in the occupation for which the training was designed. It is well known that half of the graduates of vocational education programs enter occupations other than those for which they were trained, and that the average rate of pay is higher for those who change occupational fields. The same findings appear in studies of most university professional programs. The ways to ensure that graduates do not change occupations are: train them narrowly, with no transferable skills, keep them ignorant of opportunities in other occupations, and require them to sign indentures that require long service in the occupation for which they have been trained. None of these seem desirable in a free society. Nor is this type of evaluation desirable. It is far more useful to focus on comparative unemployment rates and duration, gains in earnings and job satisfaction, and satisfactoriness to employers and customers.

REAUTHORIZATION AND THE FUTURE OF VOCATIONAL EDUCATION

Gradually, during its sixty-four-year history, vocational education has moved from an emphasis on productivity to an emphasis on equity. The needs of the nation now are fourfold: to revitalize business and industry so that it can compete in the international market; to rebuild our defense capability; to reduce inflation; and to maintain the gains we have made in providing greater equity to disadvantaged portions of our population.

Vocational education has a vast potential that has never been fully realized. Given the right mandates and incentives, its more than seven thousand schools and half a million instructors can be of major assistance in attaining national goals by doing the following:

1. Concentrating on increasing the productivity of the decreasing number of young workers, by training the large number of unskilled immigrants who will fill in the shortages of young workers, and by helping to retrain adults to use more productive equipment
2. Helping to remove bottlenecks in the training of skilled workers, thus reducing the push of shortages on inflation

3. Continuing to help disadvantaged individuals to reenter the mainstream of productive work life

Vocational education cannot be turned around by continuing to spend most of the ten cents per student hour of federal funds on maintaining existing programs. Nor can it be done by encouraging state governments and local schools to go their own way with no federal encouragement. Nor can it be done by combining CETA and vocational education into an even larger system of payment for not working and not burning down the cities. It can be done if the president and Congress let it be known that the best way to achieve equity is through skill training which leads to productivity and that they are ready to help vocational education do the job.

RECOMMENDATIONS

Policy

1. Stop spending federal funds for maintenance of existing programs and spend them only on activities that will improve programs.
2. Establish two titles in reauthorization legislation: one for promoting work productivity and one for promoting equity for individual trainees.
3. Expand the concept of contracting by CETA for public educational services to include concurrent basic education and vocational education designed to prevent school dropouts.
4. Offer incentives to states, which will establish joint ventures across state and county lines to better serve labor market areas and to increase efficiency in curriculum development and teacher training.
5. Supplement the salaries of those vocational teachers who earn less than their graduates earn after five years of employment.
6. Establish paid leaves of absence for vocational education staff who deliver instruction. Some need technical retraining, and others need to learn how to teach.
7. Decrease the degree of obsolescence of vocational education equipment and facilities by —
    a. requiring the establishment of depreciation policies and reserves for equipment and building replacement;

  b. modifying the 1981 tax law provisions for donation of new equipment to educational institutions by broadening it to include public vocational education as a recognized use of donated equipment;
  c. adding provisions that encourage business and industry to donate used equipment to vocational education before it becomes obsolete, and to replace it with equipment that makes business more competitive.

Research

1. Determine the relative costs and benefits of vocational education and other training systems at various points in the economic cycle.
2. Install a longitudinal study of the effects of vocational education. (Existing longitudinal studies, which were developed for other purposes, have determined that vocational education pays off. But the relative merits of different types of vocational education need to be studied carefully.)
3. Identify ways of —
    a. increasing the impact of research on the delivery of vocational education;
    b. assessing more accurately the "value added" by vocational education;
    c. providing vocational education more adequately to rural disadvantaged youth;
    d. identifying and terminating individual vocational programs that are not effective.

Further recommendations can be found on pages 9-16 of my paper, *Vocational Education and Reindustrialization* (Occasional Paper No. 75), published by the National Center for Research in Vocational Education.

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13

The Impact of High School Curriculum on the Earnings and Employability of Youth

INTRODUCTION

Do students' high school experiences make any difference once they leave school? Available evidence suggests that the courses students take as well as their achievement in school do influence the likelihood of their attending college (Alexander, Cook, and McDill 1978; Kolstad 1979). For those students who attend college, high school experiences also influence the type of college attended, performance in college (Smith 1967), and even the choice of college major (Polachek 1978). But previous empirical research suggests that for those students who do not go to college, high school curriculum and achievement appear to have little effect on labor market behavior once individuals have left school (Griffin and Alexander 1978; Meyer and Wise 1981). More specifically, the average level of labor

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market success achieved by students who follow a vocational curriculum appears to be approximately equal to that of comparable students who follow a traditional academic curriculum (Grasso and Shea 1979; Meyer and Wise 1981; Gustman and Steinmeier 1981). Yet, there are several reasons why this finding may be missing or masking important curriculum effects on labor market success.

First, most studies of the effects of high school curriculum have relied on students' information about their high school program, identified as either college preparatory, vocational, or general. This reliance on students' perceptions may understate the importance of curriculum differences because many students incorrectly perceive the track they are in (Rosenbaum 1980). More important, using a single measure of curriculum differences may obscure large variations in course work, thereby masking differences between students who follow and complete a full vocational program, and those who simply take a variety of unrelated vocational courses (Brown and Gilmartin 1980). Even among students who complete a full vocational program, the economic returns to vocational training may vary depending upon the specific vocational area of the program. Evidence already exists, for example, that the economic returns to vocational training in office occupations is greater than the returns to other vocational areas and the returns to academic training (e.g., Gustman and Steinmeier 1981).

Differences may also be obscured by a failure to consider the types of jobs that students obtain after leaving high school. By itself, a finding of equal average returns does not tell us whether or not vocational training and academic training develop unique skills. This finding would result if vocational and academic training were substitutes for each other—that is, if they developed similar skills and abilities. However, this type of finding does not rule out the possibility that vocational and academic training each develop different skills and provide training for different types of jobs. In this case, a focus on the finding of similar average returns serves to obscure important interpersonal and interjob variation in the relative returns to vocational and academic training.

This study will address these limitations, first by looking at differences in high school curriculum in greater detail, and second by relating high school training to occupations and labor market success. In the process, we will examine whether the returns to vocational training acquired in high school are contingent on whether students obtain an occupation corresponding to their specialty area, as has been found for other types of vocational training (Freeman 1974; Fredland and Little 1980).

We will also examine race and sex differences in both high school training and labor market opportunities. If high school training shows little effect on labor market outcomes, then race and sex differences in curricula may explain little of the observed differences in labor market opportunities among these groups. Yet if certain areas of vocational training do provide access to better paying jobs, then differences in high school curricula may be telling. Vocational training opportunities in high school are clearly divided along sexual lines, with women more likely to enroll in office occupations training and young men more likely to pursue training in technical and industrial areas (Rumberger 1980, p. 310). To a lesser degree there are also racial differences in vocational training opportunities. Thus, in some instances, race and sex differences in high school curricula may explain some of the differences in labor market opportunities after leaving school.

The data for this study are drawn from the New Youth Cohort of the National Longitudinal Surveys (NLS).* During the first interview in 1979, respondents were asked to identify the name of the high school they were currently attending or last attended. For those respondents who were seventeen to twenty-one years old in 1979 and who had last attended an American high school (8,420 out of 11,406 respondents), efforts were made to collect high school transcripts and school information.† Complete transcript data were collected for 6,591 respondents (78 percent of those eligible). We further restricted the sample to those respondents who were not enrolled fulltime during the second interview, who had completed nine to twelve years of schooling, and for whom complete transcript data were available for all the years of school completed.‡ These further restrictions resulted in a sample of 1,857 respondents. Throughout the analysis, observations were weighted by their sample weights to adjust for the oversampling of blacks, Hispanics, and disadvantaged whites.

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* For a more complete description of these data, see Center for Human Resource Research (1981).

† The data that were collected and the procedures used to collect them are described in National Opinion Research Center (1980).

‡ The last requirement dictated that a student's transcript showed three or more credits of course work for each year of school completed. For example, high school graduates were required to have transcript information for grades ten to twelve in order to be included in the sample.

In the remainder of this paper we first describe the kinds of courses that these students took in high school. Then we proceed to examine what effects their high school training has had on their labor market opportunities after leaving school.*

ACADEMIC AND VOCATIONAL TRAINING IN HIGH SCHOOL

In this study we grouped courses into three areas: academic, vocational, and other. Academic courses consist of language arts, foreign languages, mathematics, natural sciences, and social sciences. Vocational courses consist of agriculture, distributive education, health occupations, home economics, office occupations, and technical, trades and industry. † All remaining courses, including business, industrial arts, art, music, and physical education, fall into the "other" category. ‡ We chose these major divisions to differentiate between the general skills acquired from academic courses and the specific skills acquired from vocational training. Credits and grades for all tenth, eleventh, and twelfth grade courses in which a student received a passing grade were used to compute average credits within specific course categories and major curriculum areas.

Graduates completed a total of 15.4 credits during their last three years of high school, whereas dropouts completed an average of only 5.4 credits (table 13-1). Graduates completed an average of eight credits in academic subjects (52 percent of their total credits), 3.5 credits in vocational subjects (23 percent), and 3.9 credits in other subject areas (25 percent). As we might expect, students who identified their high

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* We also examined the grades students received in their courses. Since students in this study did not attend college, their grades were average—2.29 among this group, with high school graduates slightly higher and dropouts lower. Initially we thought that the grades students receive in their courses might provide an indication of how much they learned in specific subject areas, and thus be related to labor market outcomes. But grades appeared to have no significant effects.

† Because so few students had completed credits in technical areas, this category was combined with trades and industry.

‡ Course categories correspond to standard curriculum areas (Putnam and Chismore 1970). Thus business and industrial arts courses were excluded from the vocational category even though they could develop job-specific skills similar to those developed in strict vocational areas. Using detailed course categories we will be able to compare the effects of both kinds of training.

TABLE 13-1

Mean Number of High School Credits By Graduation Status, Program, and Curriculum Area

	Graduates					
Curriculum Area	*College Prep.*	*Vocational*	*General*	*Total*	*Dropouts*	*Total*
Academic	9.87	7.01	7.75	7.95	2.59	7.06
Language arts (05)	3.13	2.70	2.84	2.86	.99	2.54
Foreign languages (06)	.77	.24	.29	.37	.05	.32
Mathematics (11)	1.67	.96	1.09	1.16	.43	1.04
Natural Sciences (11)	1.81	.94	1.10	1.19	.44	1.07
Social Sciences (15)	2.49	2.16	2.43	2.37	.67	2.09
Vocational	2.16	5.08	3.14	3.49	.98	3.05
Agriculture (01)	.06	.16	.25	.19	.14	.18
Distributive ed. (04)	.11	.24	.16	.17	.06	.16
Health occupations (07)	.05	.08	.05	.06	.02	.05
Home economics (09)	.63	.80	.80	.77	.24	.65
Office occupations (14)	1.01	2.11	1.17	1.40	.20	1.20
Tech., trades & industry (16,17)	.30	1.70	.70	.90	.32	.80
Other	3.56	3.51	4.29	3.93	1.86	3.61
Business (03)	.18	.23	.22	.22	.06	.19
Industrial arts (10)	.46	.78	.89	.78	.40	.71
Art, music (02, 12)	.90	.66	1.02	.90	.34	.81
Miscellaneous (08, 18-22)	2.03	1.82	2.16	2.05	1.06	1.91
Total	15.60	15.59	15.18	15.38	5.42	13.73

NOTE: Tabulations are based on a weighted sample of seventeen- to twenty-one-year-olds who were not enrolled in school full time in the winter of 1980, who had completed nine to twelve years of school, and for whom complete transcripts data were available (N=1,857). One credit corresponds to a standard full-year course. Only credits for courses taken in grades ten through twelve are included. Numbers in parentheses refer to major curriculum areas designated by the Office of Education (Putnam and Chismore 1970).

school program as college preparatory took more academic subjects than other students, whereas vocational students took more of their course work in vocational areas. Within the academic area, students had the most credits in language arts and social sciences; within the vocational area, students had the majority of their credits in home economics, office occupations, and trades and industry. Students also took a number of courses in miscellaneous areas such as health, driver education, and physical education.

As these figures illustrate, students in all three program areas often take both academic and vocational courses. Thus program designation may reveal little about the actual academic and vocational preparation a student receives in high school. This problem may be especially acute in vocational areas that involve specific training. In order to accurately assess the effectiveness of vocational training, it is necessary to correctly identify vocational students. One way to do this is to examine what proportion of students who identify themselves as vocational students actually have completed a given number of credits in the vocational area in which they are training.†

TABLE 13-2

High School Vocational Credits by Graduation Status, Program, and Curriculum Area

	Graduates					
Vocational curriculum area	*Academic*	*Vocational*		*General*	*Dropouts*	*Total*
		*Specific**	*Total*			
Percentage with some credits						
Agriculture	4	75	9	13	11	10
Distributive education	7	71	11	11	7	10
Health occupations	3	43	3	2	1	2
Home economics	44	81	50	60	19	46
Office occupations	56	96	59	61	21	53
Tech., trades & indus.	11	67	38	24	14	24
Percentage with three or more credits						
Agriculture	1	56	2	4	1	3
Distributive education	1	40	4	2	1	2
Health occupations	1	32	1	1	1	1
Home economics	5	56	8	8	0	6
Office occupations	13	78	4	15	0	17
Tech., trades & indus.	5	54	7	12	6	13
Percentage with six or more credits						
Agriculture	0	10	0	0	0	1
Distributive education	0	8	1	0	0	0
Health occupations	0	20	1	0	0	0
Home economics	1	27	12	1	0	3
Office occupations	1	31	14	2	0	4
Tech., trades & indus.	1	32	15	4	1	6

*Students whose specific vocational program corresponded to the vocational curriculum areas that are listed.

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† Students who identified their program as vocational were also asked to identify the specific vocational area of their program: agricultural, business or office, distributive education, health, home economics, trade or industrial, or other.

Such an examination reveals that a significant proportion of vocational students have taken less than three credits in the specific area in which they were training (table 13-2). In fact, the transcripts of some students show that they have not received credit for a single course in their specific area. The proportions of students receiving given numbers of credits also vary widely by area—three-quarters of vocational students in office occupations have completed three or more credits in that area, whereas about one-third of vocational students in distributive education and health occupations had done so. Some students in other vocational areas and in college preparatory and general programs have also completed three or more credits in more specific vocational areas.

Instead of the program designation offered by students themselves, the benchmark of three credits will be used in the next part of this study to identify vocational students.* Of course not everyone who has completed three credits of vocational courses in a specific area has completed a program in that area:

> An instructional program is a combination of courses and experiences that is designed to accomplish a predetermined objective or set of allied objectives such as preparation for advanced study, qualification for an occupation or range of occupations, or simply the increase of knowledge and understanding. (Chismore and Hill 1978, p. 165)

Each vocational program consists of a particular sequence and number of courses. Although the benchmark of three credits only provides an approximate indication of students who have completed a vocational program, it offers a marked improvement over the program identification used in most previous studies.

The mean numbers of credits in various curriculum areas for specific race-sex groups of high school graduates are shown in table 13-3. Other than the observation that white women seem to be more likely than minority women to take vocational training in office occupations, there appears to be little in the way of systematic racial differences in high school curriculum. Not surprisingly, we find large sex differences in types of vocational courses taken: women tend to concentrate in office occupations and home economics, whereas men tend to concentrate in trades and industries.

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* Three credits represent a half-day of vocational training taken for a full year. This is the minimum amount of vocational training required to complete a program in certain subject areas. Other areas require more preparation.

TABLE 13-3

Mean Number of High School Credits by Sex, Race, and Curriculum Area

Curriculum area	*Females*			*Males*			*Total*
	Black	*Hispanic*	*White*	*Black*	*Hispanic*	*White*	
Academic	8.25	8.27	7.89	7.93	8.07	7.97	7.95
Language arts	2.94	2.81	2.89	2.98	2.80	2.81	2.86
Foreign languages	.43	.96	.45	.20	.58	.27	.37
Mathematics	1.31	1.10	1.04	1.30	1.25	1.26	1.16
Natural sciences	1.23	1.07	1.17	1.06	1.09	1.24	1.19
Social sciences	2.33	2.32	2.35	2.39	2.35	2.40	2.37
Vocational	3.58	3.38	4.23	2.88	2.48	2.84	3.49
Agriculture	.03	.05	.11	.21	.34	.29	.19
Distributive education	.28	.17	.13	.24	.05	.22	.17
Health occupations	.11	.03	.11	.01	.00	.00	.06
Home economics	1.39	1.13	1.14	.57	.36	.39	.77
Office occupations	1.46	1.83	2.45	.41	.34	.44	1.40
Tech., trades & indus.	.31	.17	.29	1.45	1.39	1.51	.90
Other	3.27	4.02	3.51	4.36	5.22	4.32	3.93
Business	.16	.17	.25	.14	.09	.20	.22
Industrial arts	.08	.11	.12	.85	1.39	1.52	.78
Art, music	.73	.94	1.17	.85	.81	.71	.90
Miscellaneous	2.30	2.80	1.97	2.53	2.93	1.90	2.05
Total	15.10	15.67	15.64	15.18	15.78	15.13	15.38

NOTE: High school graduates only (n = 1,429).

EFFECTS ON LABOR MARKET OUTCOMES

The effects of high school curriculum were estimated through a series of equations that expressed several measures of labor market success as a linear function of high school course work and an array of control variables. Estimates were derived using ordinary least squares regression. Course work represents the number of credits completed in various subject areas and was expressed in varying degrees of detail. Unlike previous studies that use dummy variables to distinguish between vocational, academic, and general curriculum areas, we were able to measure the actual *amount* of course work taken by each person in specific subject areas.

Because our sample consisted of persons who had completed from nine to twelve years of schooling, the number of credits completed in grades ten through twelve varied from zero to over twenty. Thus we can estimate the incremental effects of taking additional training in various curriculum areas as well as the relative effects of taking more courses in one area (e.g., vocational) versus another area (e.g., academic).

In each equation the same set of control variables was included to minimize any bias due to students of different backgrounds and abilities selecting different high school subjects.* Background variables included a measure of parental education and a cultural index indicating the presence of newspapers, magazines, and a library card in the respondent's original home. The respondent's grade point average in the ninth grade was used as an early ability measure.† Additional control variables included race, marital status, children, sex-children interaction, and postschool experience.‡

In order to examine different dimensions of labor market behavior and success, we analyzed three labor market outcome variables: hourly earnings in the 1980 survey week, the number of weeks unemployed in the previous year, and the number of hours worked in the previous year.*

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*Of course this approach only controls for selection bias associated with measured control variables. Systematic selection on unmeasured variables such as motivation or parental encouragement that is independent of the measured controls may also produce bias in the effects of high school curriculum on labor market success.

†Indicators of mental ability, primarily IQ test scores, were collected along with the transcripts. Although these test scores were preferred on a conceptual basis, we decided not to use them because of the low response rates (about 50 percent), differences in the kinds of tests taken, and the wide range in the age when the test was taken.

‡More specifically, the control variables were measured as follows. Parental education was the number of years of school completed by either the respondent's mother or father, whichever was greater. The cultural index was the sum of three dichotomous variables each indicating the presence (=1) or absence (=0) of newspapers, magazines, or a library card in the household when the respondent was fourteen years old. Grade point average was computed from all courses taken in the ninth grade in which the student received a passing grade. Passing grades were converted to numerical equivalents, with A=4, B=3, C=2, D=1, and F=0. The two race variables included an indicator for being black (=1; 0=otherwise) and an indicator for being Hispanic (=1; 0, otherwise). Marital status equals 1 if married, spouse present; 0, otherwise. Children is the number of children living with the respondent. The sex-children interaction is the product of sex and children. Postschool experience is the number of months between the date the respondent last left school and the date of interview.

Estimates were derived for respondents in our basic sample (1,857 cases) who had complete information on the dependent variables and information on most of the independent variables.† Males and females were analyzed separately since they tend to have different labor market experiences and generally acquire different vocational training in high school. Estimates for each of the three dependent variables are shown in separate panels in table 13-4 for males and in table 13-5 for females. The estimated effects of the control variables are excluded from these tables, but they are shown for a representative equation in Appendix table A-1.

As a reference point, the first equation in each table shows the effects of the standard measure of educational attainment—years of school completed. The effect of years of school completed on hourly earnings (.047 for males and .055 for females) is slightly lower but fairly consistent with previous studies using a similar measure of educational attainment (e.g., Griliches 1976). However, precise comparisons with the results of previous studies are difficult since we observe earnings very early in the work career and restrict our analysis to those who do not go on to college. Although not shown in the tables, we also ran the years completed equation adding a "diploma" variable to test for a credentialism effect. Surprisingly, there

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* Since our sample ranges in age from eighteen to twenty-two years of age, these variables measure labor market standing in most cases from one to seven years after leaving school. Our results may be influenced by differences in the number of years since leaving school (although we control for this) as well as the particular year in which we measure labor market outcomes (1980). See the discussion by Gustman and Steinmeier (1981).

† Observations were excluded from an equation if they had missing data on any variable included in the equation except parental education, the cultural index, and grade point average for the ninth grade. Race-sex specific means were substituted for missing data on parental education and the cultural index. Values were inputed for missing data on grade point average for the ninth grade based on a regression equation including the following explanatory variables: black, Hispanic, sex, parental education, cultural index, knowledge of the world of work, age, early mental ability test score, and a dichotomous variable indicating missing data on any early ability test score. In addition, observations were eliminated from the weeks unemployed last year and hours worked last year regressions if they had not been out of school for at least twelve months as of the date of interview.

TABLE 13-4

The Effects of Curriculum on Labor Market Success for Young Men Who Do Not Go On to College

	Equation				
	(1)	*(2)*	*(3)*	*(4)*	*(5)*
			(Log) Hourly earnings		
Years completed	.047*				
Total credits		.004			
Academic			.007	.008	.008
Vocational			.005		
Vocational (nonprogram)				-.009	-.010
Vocational (program)				.004	
Vocational (program, not used)					-.001
Vocational (program, used)					.007
Other			-.001	-.0005	-.0005
$\bar{R}^2$	.12	.11	.11	.11	.11
N	713	713	713	713	713
			Weeks unemployed		
Years completed	-2.620***				
Total credits		-.404**			
Academic			-.575**	-.583**	-.584**
Vocational			-.305*		
Vocational (nonprogram)				.148	.151
Vocational (program)				-.304*	
Vocational (program, not used)					-.264
Vocational (program, used)					-.325*
Other			-.196	-.221	-.220
$\bar{R}^2$	.08	.07	.08	.08	.08
N	515	515	515	515	515
			Hours worked		
Years completed	239.90**				
Total credits		32.797**			
Academic			14.149	13.940	14.222
Vocational			52.331**		
Vocational (nonprogram)				67.859*	66.554**
Vocational (program)				52.281**	
Vocational (program, not used)					35.263*
Vocational (program, used)					61.758**
Other			47.156**	45.238**	46.127**
$\bar{R}^2$	.14	.12	.13	.13	.13
N	515	515	515	515	515

NOTE: One asterisk indicates statistical significance at the .05 level, and two asterisks indicate significance at the .01 level. The standard errors for equation (3) are shown in Appendix table A-1. The control variables included in the regressions are described in the text and their effects are shown in Appendix table A-1.

TABLE 13-5

The Effects of Curriculum on Labor Market Success for Young Women Who Do Not Go On to College

	Equation				
	(1)	*(2)*	*(3)*	*(4)*	*(5)*
			(Log) Hourly earnings		
Years completed	**.055***				
Total credits		**.010***			
Academic			**.011***	**.011***	**.012***
Vocational			**.010***		
Vocational (nonprogram)				**.003**	**.002**
Vocational (program)				**.009**	
Vocational (program, not used)					**-.002**
Vocational (program, used)					**.015****
Other			**.008**	**.008**	**.009**
$\overline{R}^2$	**.06**	**.06**	**.06**	**.06**	**.06**
N	**648**	**648**	**648**	**648**	**648**
			Weeks unemployed		
Years completed	**-2.190****				
Total credits		**-.356****			
Academic			**-.435****	**-.433****	**-.457****
Vocational			**-.503****		
Vocational (nonprogram)				**-.546***	**-.523***
Vocational (program)				**-.509****	
Vocational (program, not used)					**-.362****
Vocational (program, used)					**-.658****
Other			**-.056**	**-.054**	**-.079**
$\overline{R}^2$	**.05**	**.05**	**.06**	**.06**	**.06**
N	**565**	**565**	**565**	**565**	**565**
			Hours worked		
Years completed	**257.86****				
Total credits		**38.710****			
Academic			**47.321****	**44.929****	**51.138****
Vocational			**55.942****		
Vocational (nonprogram)				**95.967****	**68.388****
Vocational (program)				**60.519****	
Vocational (program, not used)					**17.073**
Vocational (program, used)					**104.24****
Other			**4.734**	**2.139**	**10.645**
$\overline{R}^2$	**.35**	**.34**	**.35**	**.35**	**.39**
N	**576**	**576**	**576**	**576**	**576**

NOTE: One asterisk indicates statistical significance at the .05 level, and two asterisks indicate significance at the .01 level. The standard errors for equation (3) are shown in Appendix table A-1. The control variables included in the regressions are described in the text and their effects are shown in Appendix table A-1.

was no evidence of a credentialism effect.* In the second equation in each panel, we substituted total credits for years completed and found the results to be fairly consistent for men and women. As expected, both variables have positive effects on hourly earnings and hours worked and negative effects on weeks unemployed. Given that a normal school year usually consists of five or six credits, the size of the metric coefficients for years completed and total credits correspond closely for women and moderately well for men. The main exception is that the effect of total credits on hourly earnings is quite small for men.

In the third equation, we partition credits into three basic categories: academic, vocational, and other. In most cases, academic and vocational course work have similar effects. For hourly earnings, the effects of both types of course work are insignificant for men and significant for women. The metric coefficients for women imply that a half day's course work for a school year (i.e., about three credit hours) of either academic or vocational courses would increase hourly earnings by about 3 percent. For weeks unemployed, the results imply that a half day's course work would reduce unemployment by about one to one and one-half weeks per year, with the effects of academic training being stronger for men and the effects of vocational training being slightly stronger for women. Both academic and vocational training have strong effects on annual hours worked for women: a half day's course work of either is associated with working about 150 more hours per year, the equivalent of almost four weeks of full-time work. The biggest difference in effects is for hours worked for men; whereas the effect of vocational training is as strong as it is for women, the effect of academic training is insignificant.

Although not directly comparable, our results are fairly consistent with several previous studies of the relative effects of vocational and academic courses. Using a set of dummy variables to measure curriculum, Grasso and Shea (1979) found that, net of the control variables, the labor market experience of "the average male graduate of a vocational program who did not go on to college was not substantially different from that of the average general program graduate" (p. 156). Results such as these have often been interpreted as negative evidence of the effectiveness of vocational education. But this interpretation requires one to also conclude that a general curriculum is ineffective. Our specification and results suggest that a more appropriate interpretation is that, in general, *both* academic and vocational curriculum have a significant positive impact on labor market success.

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* The coefficient for the diploma variable (equal to one if the respondent received a high school diploma and equal to zero if not) was insignificant in five of the six equations and had the unexpected sign in half of them. More specifically, for men, the coefficients (and t values) were -.053 (-.7), -.38 (-.2), and -317 (-1.9) for hourly earnings, weeks unemployed, and hours worked, respectively. For women, they were .065 (.8), 2.72 (1.6), and -213 (-1.3).

Other course work appears to have relatively small effects on labor market success. The main exception is for hours worked where other course work had a substantial positive effect for men. In addition, the effect of other courses on hourly earnings is nontrivial for women, although its t-value is only 1.2 (Appendix table A-1) and therefore not statistically significant at traditional levels.

We also performed parts of the analysis with the sample restricted to those who graduated from high school and in which academic, vocational, and other credits were coded as proportions of total credits. Since academic, vocational, other, and total credits are linearly dependent, the academic credits variable was omitted from the analysis and thus serves as a reference for evaluating the effects of vocational and other credits. This specification corresponds more closely to the traditional specification used by Grasso and Shea (1979) and others. The results from this alternative specification are similar to those discussed above in that the only instance in which the effects of vocational training is significantly different from academic training is the stronger and more positive effects of vocational training on hours worked for men.

Because vocational training develops specific job skills, the labor market benefits of vocational courses that are part of a complete vocational program may be higher than the benefits from unrelated vocational courses. In order to examine this issue, two separate vocational training variables were created, a vocational program variable and a nonprogram vocational variable. In the coding of these variables, all of a student's vocational credits were counted either in the vocational program variable (if the student completed at least three credits in one specific vocational area), or in the nonprogram vocational variable. The results for the equations in which these two variables were substituted for the general vocational variable are shown as equation (4) in tables 13-4 and 13-5. The effects of the vocational program variable for men were in the anticipated direction for all three labor market outcome variables, although its effect was not significant for hourly earnings (see table 13-6). On the other hand, the nonprogram vocational variable had a detrimental effect on

TABLE 13-6

Effects of High School Curriculum on Labor Market Success: Proportional Specification

	Males			*Females*		
	(1)	*(2)*	*(3)*	*(1)*	*(2)*	*(3)*
				(Log) Hourly earnings		
Vocational	-.081			-.009		
Vocational (Nonprogram)		-.248	-.258		-.098	-.118
Vocational (Program)		-.052			-.044	
Vocational (Program, not used)			-.185			-.239*
Vocational (Program used)			.010			.066
Other	-.121	-.090	-.087	-.049	-.052	-.030
Total credits	-.006	-.008	-.008	.006	.006	.006
$\bar{R}^2$	.12	.12	.12	.04	.04	.05
N	579	579	579	582	582	582
				Weeks unemployed		
Vocational	4.311			-2.571		
Vocational (Nonprogram)		12.409**	12.681**		-1.538	-1.135
Vocational (Program)		3.568			-1.265	
Vocational (Program, not used)			5.990*			.487
Vocational (Program, used)			2.356			-2.821
Other	4.418	3.200	3.291	7.177**	8.326**	7.996*
Total credits	-.086	-.036	-.029	-.288*	-.312*	-.308*
$\bar{R}^2$	.06	.06	.06	.04	.04	.04
N	407	407	407	464	464	464
				Hours worked		
Vocational	603.78*			297.43		
Vocational (Nonprogram)		435.74	397.33		516.20	352.31
Vocational (Program)		597.00*			250.41	
Vocational (Program, not used)			251.29			-411.25
Vocational (Program, used)			774.93**			827.88**
Other	355.63	346.26	334.06	648.00**	779.90**	-635.62**
Total credits	-20.229	-21.259	-22.098	10.720	14.378	13.015
$\bar{R}^2$	.12	.12	.12	.33	.33	.37
N	407	407	407	467	467	467

NOTE: All curriculum area credits are the proportion of total credits in this area. One asterisk indicates statistical significance at the .05 level, and two asterisks indicate significance at the .01 level. The control variables included in the regressions are described in the text.

hourly earnings and unemployment, although its effect on hours worked was positive and significant. These results generally support the hypothesis that participating in a specific vocational program does have payoff in the labor market, although an occasional vocational course does not. The evidence for women is less conclusive: the effect of nonprogram vocational training on weeks unemployed and hours worked is as strong or stronger than that of training in a specific vocational program. Only for unemployment is the effect of the vocational program variable somewhat stronger.

Again, because vocational training develops specific job skills, its economic benefits may also depend on whether or not the individual is employed in an occupation where the training can be utilized. To test this notion, vocational program credits were further partitioned into two categories: one for program credits related to the respondent's occupation, the other for the remaining program credits. The occupational and educational code crosswalk prepared by the National Occupational Information Coordinating Committee (1979) was used to partition program credits. For each specific vocational area, the crosswalk provides a list of occupations that were judged to use the skills taught in that area.* These two variables were substituted for the vocational program variable in equation (5), tables 13-4 and 13-5. These results show that for both men and women and for each labor market outcome, the effect of vocational training used on the job is greater than the effect of vocational training that is not used on the job. Thus, it appears that vocational training yields a higher payoff for those individuals who are employed in jobs where their training can be utilized.

How many men and women hold jobs related to their area of high school vocational training? Table 13-7 shows the proportion of students taking (or not taking) vocational programs in specific areas and having occupations corresponding to that area. For example, the top row of the table indicates that among men who took a vocational program in agriculture, 42 percent held an occupation in 1980 that corresponded to that area, whereas only 17 percent of other men (i.e., those who took a different vocational program or no vocational program at all) held that type of job. In most areas, vocational training substantially increases the likeli-

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*Although the crosswalk matches occupations to detailed vocational course categories, we only attempted to match respondents' occupations (1970 Census codes) to broad vocational categories (e.g., agriculture). For some of the more heterogeneous occupational categories (i.e., managerial, not elsewhere classified), we also required a match between the industry listed in the crosswalk and the respondent's industry.

TABLE 13-7

Percentages of Students Taking (or Not Taking) Vocational Programs in Specific Areas Who Obtained a Job in an Occupation That Corresponded to That Area by Specific Area and Sex

Vocational and occupational area (No. of students in program)	*Specific Vocational Program Participation**	
	Yes	*No*
	Men	
Agriculture (40)	42	17
Distributive education (16)	38	27
Health occupation (0)	-	5
Home economics (13)	4	6
Office occupation (16)	54	19
Trade and industrial (191)	65	59
	Women	
Agriculture (9)	3	7
Distributive education (16)	66	28
Health occupations (16)	40	6
Home economics (97)	15	13
Office occupation (248)	60	35
Trade and industry (34)	26	32

NOTE: For example, the entry in the top row in the left-hand column indicates that 42 percent of the students who participated in an agricultural vocational program obtained an occupation that utilizes skills developed in agricultural training programs. The entry in the top row in the right-hand column indicates that 17 percent of students who did not participate in an agricultural vocational program (i.e., either participated in a program in another vocational area or did not participate in any vocational program) obtained an occupation that utilizes skills developed in agricultural vocational programs.

*The entries for the number of students in a program are unweighted, whereas the main entries are weighted percentages.

hood of an individual obtaining related employment. Apparently, either these programs are teaching important job-related skills or at least many employers think they do. Two exceptions to this general finding are trades and industry and home economics. For both male and female students in these areas, the likelihood of their finding related employment is about the same as for students from other areas.*

The variation across programs in the degree that training was used on the job raises the question of whether the labor market returns to vocational training varied by specific area of study. To examine this issue, we further partitioned our vocational training variables into detailed areas while retaining the distinction between whether the training constituted a program, and if so whether it was used on the job. However, the small number of men and women taking training in some areas required the combining of smaller vocational areas into one category (table 13-8). In addition, we divided the academic credits into specific areas. Dividing academic and vocational credits into these detailed categories reduces the precision of the estimated effects, and thus they need to be interpreted cautiously.

Within specific academic areas, few systematic patterns emerge. For men, language arts stands out as the strongest determinant of hourly earnings, whereas language arts, mathematics, and the natural sciences all have moderate effects on unemployment and hours worked. For women, the social sciences and foreign languages have the greatest impact on hourly earnings, whereas the natural sciences and foreign languages have the strongest effects on unemployment and hours worked.

Within vocational areas, the effects of the variables measuring non-program vocational training and vocational program training not used on the job appear to be rather unstable, so we will restrict our attention to the effects of vocational program training used on the job. For men, it appears that trades and industry training increases hourly earnings somewhat (though the coefficient is not significant) but has little effect on unemployment or hours worked, although other types of vocational training, including agriculture, have no positive effect on hourly earnings but do have a substantial favorable impact on unemployment and hours

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* This may be partly due to the broad and heterogeneous nature of the trades and industry category of occupations. About 60 percent of all the occupations held by these men required skills related to trades and industry vocational training. Perhaps a matching of more detailed breakdown of these program areas and occupations would yield different results.

TABLE 13-8

The Effects of Detailed Categories of Curriculum on Labor Market Success for Young Men and Women Who Do Not Go On to College

	Males			*Females*		
	(Log) Hourly earnings	*Weeks unemployed*	*Hours worked*	*(Log) Hourly earnings*	*Weeks unemployed*	*Weeks worked*
Academic						
Language arts	.054*	-.600*	36.913	-.023	-.083	25.883
Foreign language	.010	-.394	-50.820	.048	-1.099**	65.327*
Mathematics	-.021	-.674	21.069	.003	.032	8.966
Natural science	.005	-.625	21.405	.013	-.676	161.17**
Social science	-.028*	-.518	-3.066	.035*	-.427	3.266
Vocational (nonprogram)						
Agriculture	-.002	1.550	125.09			
Home economics				-.004	-.793*	36.386
Office occupations				.005	-.940*	203.11**
Trades and industry	-.042*	.610	41.411			
Other	.005	.231	67.466*	.043*	.175	41.733
Vocational (program, not used)						
Agriculture	.030	-.984	93.764			
Home economics				-.011	.067	-4.880
Office occupations				-.005	-.644**	39.874*
Trades and industry	-.012	-.362	26.973			
Other	.0004	.078	12.521	.011	-.538*	-18.609
Vocational (program, used)						
Agriculture	-.022	-.956	297.19**			
Home economics				-.019	-.904	48.271
Office occupations				.024**	-.724**	138.22**
Trades and industry	.008	-.271	37.208*			
Other	-.010	-.617	98.874*	.012	-.667*	105.79**
Other	-.001	-.221	40.847**	.011*	-.102	17.191
	.13	.07	.15	.08	.07	.41
	713	515	515	648	565	576

NOTE: One asterisk indicates statitistical significance at the .04 level, and two asterisks indicate signficance at the .01 level. The control variables included in the regression are described in the text.

worked. For women, training in office occupations stands out as having the strongest favorable effect on each dimension of labor market success. Although training in home economics appears to increase hours worked and decrease unemployment for women, its effect on hourly earnings is not favorable.

TABLE 13-9

Effects of High School Curriculum on Labor Market Success For Different Samples Defined According to Race, Ethnicity, Socioeconomic Background, and Mental Ability

Sample	*Academic*	*Vocational*	*Other*
	(Log) Hourly earnings		
Total (1361)	.010**	.007*	.002
Whites (926)	.010*	.009*	.002
Blacks (242)	.006	-.007	.015
Hispanics (193)	.018*	.014	-.001
GPA9 <=2.2 (674)	.012*	.004	-.0004
PED <12 (455)	.018**	-.010	.008
GPA9 >2.2 (687)	.010*	.011*	.004
PED >=12 (906)	.008	.012*	-.0002
	Weeks unemployed		
Total (1080)	-.514**	-.412	-.133
Whites (727)	-.577**	-.446**	-.155
Blacks (207)	-.441	-.442	-.323
Hispanics (146)	-.031	-.337	-.461*
GPA9 <= 2.2 (564)	-.511**	-.413**	-.314*
PED <12 (386)	-.450**	-.551**	.121
GPA9 >2.2 (516)	-.628**	-.520**	-.085
PED >=12 (694)	-.615**	-.420**	-.288**
	Hours worked		
Total (1091)	29.871**	55.997**	25.365**
Whites (725)	26.117**	51.133*	46.736
Hispanics (151)	53.516*	75.538**	21.464
GPA9 <= 2.2	34.036**	44.217**	53.322**
PED <12 (391)	38.616**	81.314**	31.947
GPA9 >2.2 (518)	30.697**	71.685**	4.302
PED >=12 (700)	27.350**	47.244**	23.309*

NOTE: One asterisk indicates statistical significance at the .05 level, and two asterisks indicate significance at the .01 level. The control variables included in the regressions are described in the text.

Another question we explored is whether different types of course work are more or less helpful to different types of students. For example, it is widely believed that the students who are at a disadvantage either because of race, ethnicity, social background, or cognitive abilities will be the primary beneficiaries of vocational training. Our sample is already restricted to those who do not go on to college and thus already contains an overrepresentation of disadvantaged students. However, to further explore this issue, we reestimated the effects of academic, vocational, and other credits (i.e., equation (3) in tables 13-4 and 13-5) on labor market outcomes for several subsamples that distinguish between individuals who might be considered to be either disadvantaged or not disadvantaged based upon race, ethnicity, social background, or cognitive ability. This analysis was not disaggregated by sex because the size of some of these subsamples is already quite small and because the results presented so far have suggested only small sex differences in the relative effects of academic and vocational course work. In terms of race and ethnic differences, there appears to be little in the way of any systematic pattern. However, there is some evidence that the effects of both academic and vocational training on hourly earnings are lower for blacks than for whites and Hispanics. It also appears that for Hispanics, the effects of both these types of course work are weaker for unemployment and stronger for hours worked than for other individuals (table 13-9). The bottom four rows of table 13-9 show the results for those who are above and below average for our sample in terms of social background or cognitive ability.* For unemployment and hours worked there are no systematic differences between the disadvantaged and the advantaged groups in the relative effects of academic and vocational training. For hourly earnings, vocational training has stronger effects than academic training in the advantaged groups relative to the disadvantaged groups, which, if anything, contradicts the hypothesis that the disadvantaged are the primary beneficiaries of vocational training and suggests that perhaps the most important need for disadvantaged students is training in basic skills.

CONCLUSIONS

Several findings emerge from this study. Among women who do not go on to college, academic and vocational training have equally strong effects on the different dimensions of labor market behavior and success that we examined. Although the size of the effects has to be interpreted with caution, the effects do suggest that, for women, an additional half day's course work for a school year (i.e., about three credit hours) of either academic or vocational course work would lead to about 3 percent higher hourly earnings, one to one and one-half fewer weeks of unemployment per year, and 150 more hours worked per year.

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*Social background is measured using parental education; cognitive ability is measured using ninth grade GPA. See the third footnote on p. 287 for a description of these variables.

For men, the results vary depending upon the outcome variable being examined. The effects of both types of training on unemployment are as strong as for women, but their effects on hourly earnings are smaller and statistically insignificant. The only case in which there was a significant difference in the effects of these types of curriculum was for hours worked for men: whereas the effect of vocational training for men was as strong as it was for women, the effect of academic training was insignificant.

The payoff of vocational training appears to vary in some important respects. Vocational training that constitutes a specific program has a greater impact on labor market outcomes than vocational training in unrelated areas. In addition, the payoff of vocational program training is higher for persons employed in jobs where their training can be used. Moreover, except in the area of trades and industry and home economics, vocational students were substantially more likely than other students to obtain employment in occupations that utilized their vocational skills. These results suggest that in order to measure the payoff of vocational training, it is necessary to have more detailed information on the type of vocational training taken and the area of employment. Our results also show, however, that very large-sized samples are needed in order to estimate with precision the relative effects of detailed categories of curriculum on labor market success.

It is interesting to note that the strongest vocational training effects were associated with training in office occupations. We suspect that these high returns are a result of the recent growth in the service and clerical sectors of the economy where this type of training is particularly demanded. In any event, this finding suggests that the demand side of the youth labor market should be considered more carefully. Any evaluation of the current state of vocational education or any prescription for a restructuring of vocational priorities and programs should consider the demand, both present and future, for workers in specific occupations as well as possible changes in occupational skill requirements due to technological change.

We observed substantial sex differences in the types of vocational training taken, with men concentrating in trades and industries and women concentrating in office occupations and home economics. This sex segregation in vocational training surely contributes to sex segregation in occupations. Although the relative payoff of the types of training taken by women appears to be at least as high as the payoff of the types of training taken by men, this segregation may help perpetuate inequality indirectly by contributing to the idea that it is natural for men and women to do different work. This suggests that stronger efforts should be made to provide greater access to all program areas for both men and women. Important parts of this effort would be to better inform boys and girls of career opportunities in both traditional and nontraditional areas, and to provide additional support for students in nontraditional areas once they have entered.

The effects of vocational training on hourly earnings appear to be lower for blacks than for whites. But since the effects of vocational training on unemployment and hours worked are similar for blacks, Hispanics, and whites, and since members of each of these groups take similar types of high school courses, vocational training appears to have little overall impact one way or the other on racial and ethnic inequality.

Our results suggest that we need to modify our interpretation of traditional statistical analyses that measure the "returns" to vocational education by contrasting the labor market success of vocational students with academic curriculum students and by controlling for other characteristics. Interpreting insignificant parameters measuring the differences in labor market success between vocational and academic students as indicating the lack of an economic return or benefit to investment in vocational training can be misleading for policy purposes. Such results mean that the payoff of a vocational curriculum is not significantly greater than the payoff of an academic curriculum, but it also means that the payoff of an academic curriculum is not significantly greater than the payoff of a vocational curriculum. Such results are entirely consistent with our conclusion that both vocational and academic curricula have positive returns.

How our findings and those of previous studies should be interpreted depends critically on the degree to which vocational and academic course work are substitutes for each other. To the extent that they promote the development of the same abilities and skills and help prepare students for the same occupational roles, they should be considered as substitutes. In this case, the finding of equal payoffs would imply that resource allocation decisions should be made strictly on the basis of cost, with the greatest emphasis being placed on the less expensive curriculum. If this were to imply that vocational programs should be cut, students could simply replace vocational training with equally valuable academic training and be no worse off.

If, on the other hand, some students benefit more from a vocational program whereas others benefit more from an academic program, or if vocational and academic programs promote the development of different occupational skills, then they are not substitutes. In this case, the finding of similar "average" returns of vocational and academic training masks important interpersonal and interjob variation where, for example, the net benefit (i.e., benefits minus costs) of vocational training may be positive for large subsets of individuals and jobs even if the average costs of vocational training were greater than for academic training.

There is evidence that vocational and academic course work are less than perfect substitutes. Not to be overlooked is the simple fact that these curricula differ in content. Relative to academic courses, vocational courses help students develop skills that have particular relevance to specific occupational roles. The results of our study also suggest that, at least for some areas, vocational students were more likely than other students to obtain employment in occupations that utilize vocational skills. Apparently, either these programs are teaching important job-related skills or at least many employers think that they do. In addition, our results indicate that to a substantial degree for women and to a lesser degree for men, the returns of vocational program training that were used on the job were greater than the returns of academic training. And, of course, we found, as have others, that some specific areas of vocational training such as office occupations appear to have greater returns in terms of earnings and employability than academic training, whereas other areas do not. However, this evidence only begins to address important questions about the ways in which academic and vocational training substitute for each other. We recommend that such questions be given a high priority in future research agendas.

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APPENDIX TABLE A-1

Effects of Curriculum and Control Variables on Labor Market Outcomes for Men and Women Who Do Not Go On to College

	(Log) Hourly earnings		*Weeks unemployed*		*Hours worked*	
	Male	*Female*	*Male*	*Female*	*Male*	*Female*
Academic credits	.007	.011	-.575	-.435	14.149	47.321
	(1.42)	(1.87)	(-4.56)	(-3.51)	(1.23)	(4.25)
Vocational Credits	.005	.010	-.305	-.503	52.331	55.942
	(.76)	(1.64)	(-2.04)	(-4.02)	(3.78)	(4.83)
Other credits	-.001	.008	-.196	-.056	47.156	4.734
	(-.16	(1.22)	(-1.29	(-.38)	(3.36)	(.35)
Ninth grade GPA	.005	.038	.219	-.207	31.370	137.79
	(.19)	(1.71)	(.35)	(-.40)	(.57)	(2.84)
Black	-.050	.030	3.365	3.00	-393.70	8.968
	(-.98)	(.58)	(2.85)	(2.74)	(-3.55)	(.09)
Hispanic	-.043	.028	-1.207	-1.448	-34.244	221.05
	(-.63)	(.42)	(-.71)	(-.97)	(-.22)	(1.60)
Married, spouse present	.072	-.017	-1.301	-.355	320.96	-212.17
	(1.69)	(.54)	(-1.40)	(-.52)	(3.66)	(-3.27)
Months since leaving school	.006	.004	-.066	-.035	11.201	8.253
	(6.87)	(5.38)	(-2.53)	(-1.56)	(4.64)	(1.56)
Number of children	.025	-.101	.384	-.132	-170.74	-567.83
	(.54)	(-3.11)	(.41)	(-.25)	(-1.79)	(-11.48)
Parental education	.007	.002	-.274	-.147	12.421	15.546
	(1.17)	(.27)	(-1.05)	(.87)	(.87)	(1.22)
Cultural index	.069	.012	.517	-.005	-1.275	99.656
	(3.65)	(.71)	(1.16)	(-.01)	(-.03)	(2.75)
Constant	5.697	5.524	13.194	11.851	856.63	174.54
	(56.16)	(53.45)	(5.24)	(5.39)	(3.65)	.88
$\bar{R}^2$	.11	.06	.08	.06	.13	.35
S.E.E.	.37	.32	7.68	7.20	713.74	679.01
	713	648	515	565	515	576

NOTE: These results correspond to equation (3) in tables 13-4 and 13-5.

ROBERT H. MEYER

14

Job Training in the Schools

INTRODUCTION

This paper analyzes the effects of vocational education in the labor market. Our research differs from previous evaluations of vocational education in three major respects. First, we report results based on a measure of vocational education that is in many ways more accurate and informative than previous measures of vocational education. Our definition is based on actual course enrollment data available in the National Longitudinal Study of the High School Class of 1972.* Second, we report estimates of the effects of vocational education on individual wages, hours, and employment for eight consecutive years following high school graduation. Consequently, we are able to construct estimates of earnings profiles associated with different levels of vocational education. Finally, we summarize differences in the economic effects of vocational education for

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*In another paper (Meyer 1981a) we compare alternative measures of vocational education. Definitions based on high school program (e.g., an academic, general, or vocational program) were found to be very poor measures of coursework in vocational subjects.

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the first eight years in the work force by estimating the present discounted value of income associated with different levels of vocational education. Furthermore, these present value estimates are decomposed into separate components attributable to wages, hours, employment, and interactions among the three outcomes. Separate results are presented for men and women, and for blacks and Hispanics, by sex.

We find evidence of important positive effects of commercial coursework for women and modest benefits to trade and industrial arts courses for men. Coursework in home economics is associated with a significant decline in earnings for women. There is weak evidence that Hispanic women gain more from commercial training than either black or white women.

The plan of the paper is as follows. The next section presents a framework for analyzing the economic effects of vocational education. The subsequent section presents calculations of average earnings and employment associated with different levels of vocational education. The last section presents econometric estimates of the effect of vocational education on labor market outcomes, and constructs estimates of age-earnings profiles associated with different curriculum. The paper closes with a brief set of conclusions.

A FRAMEWORK FOR ANALYZING VOCATIONAL EDUCATION

Within the last twenty years economists have devoted a great deal of attention to studying the economics of education, and, in particular, the rate of return to schooling. Equations of the following type have typically been estimated.

$$(1)\quad \log Y_i = X_iB + \delta S_i + e_i$$

where Y_i measures wages, earnings, or income of the ith person, S_i measures years of schooling,* X_i contains other determinants of wages, such as ability and experience, and e_i is a random error. Variations of this equation have allowed for nonlinearities in the return to schooling, large threshold effects of obtaining a high school or college degree, endogeneity of the choice of schooling, the problem of omitted variable bias, especially with respect to omitted measures of ability, and sample selectivity.* In general, the evidence points to a substantial return to high school and college education, perhaps in excess of the rate of return to capital investment.†

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*Alternatively, S_i can be measured as the total number of academic credits.

Improvements in the quality of instruction, and the introduction of new subjects that are more efficiently taught in the classroom than in the labor market, can be expected to increase the rate of return to schooling.‡ Federal, state, and local policies to change student-teacher ratios, provide better facilities, and make coursework more relevant to the labor market are presumably motivated by this desire. Here, we are concerned with whether or not increasing the availability of vocational education in high school enhances the economic return to a high school education.

Two types of information can be used to investigate this issue. First, changes over time or across different school systems in the availability and quality of vocational education can be compared with corresponding changes in the economic return to high school education. Since other factors may also affect the return to education, for example, returns to alternative capital investments, the availability of student loans, the demand for schooling, the quality of instruction, and demographic cycles (i.e., the baby boom), it may be difficult to identify the independent contribution of vocational education. A second approach, which will be used in this paper, is based on the comparison of different individuals with different levels of vocational coursework. In this section we will examine what can be learned about vocational education with this type of data.

Suppose that academic and vocational courses differ in their economic benefits. The effects of academic (A_i) and vocational (V_i) coursework are measured by δ and Θ, respectively, in equation (2).

$$(2) \quad Y_i = X_i B + \delta A_i + \Theta V_i + e_i$$

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*See, for example, Rosen (1977) and Griliches (1977) for a survey of some of these issues; Griliches, Hall, and Hausman (1977); and Willis and Rosen (1979).

†Followers of the human capital school interpret this finding as providing evidence that schooling increases skills and productivity. Advocates of the screening hypothesis suggest that schooling merely serves to identify highly productive individuals from less productive individuals.

‡In the long run, of course, short-run changes in rates of return to education can be expected to trigger changes in the behavior of individuals, thus inducing a general rise in the return to all investments.

Y_i is an appropriate measure of economic gain, such as the present discounted value of lifetime income or annual income.* Since total schooling is the sum of academic and vocational courses, we can rewrite equation (2) as:

$$(3) \quad Y_i = X_i B + \delta S_i + (\Theta - \delta)V_i + e_i$$

In models that limit analysis to individuals with a fixed level of schooling (e.g., $S_i = 12$, a high school degree), the coefficient on vocational education measures the benefits of vocational education relative to academic courses.† If this coefficient is positive, there are benefits to increasing the percentage of coursework devoted to vocational coursework. Consequently, estimates of equation (3) provide evidence of whether or not it would be efficient to shift individuals into additional vocational coursework.‡

However, as individuals shift toward more vocational instruction, satisfying the excess demand for vocational skills, the relative advantage of vocational education will fall. In the absence of barriers to taking more vocational education, individuals have a powerful incentive to shift to vocational courses up to the point where the gains of taking more vocational education are exhausted. Consequently, estimates of equation (3) also provide evidence of (1) whether or not individuals respond to differences in the benefits of alternative curriculum, or (2) the existence of barriers to enrollment in different curriculum.§

So far we have treated the process of acquiring skills in high school as a black box. Presumably the kinds of skills that are acquired in vocational education, if any, differ substantially from those acquired in academic courses. In the ensuing analysis we will distinguish the following three different skills that are potentially acquired in high school:

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*The appropriate measure of economic gain depends on whether or not the gains (or losses) from vocational education vary over time. This issue will be discussed later.

†Most evaluations of vocational education fall into this category, for example, Grasso and Shea (1979), Meyer and Wise (1979), Hofferth (1980), and Gustman and Steinmeier (1981).

‡We may want to complicate the analysis by allowing for increasing or decreasing returns to concentration in vocational education. If there are increasing benefits to vocational coursework, then it would be efficient to increase the number of individuals taking a high level of coursework without increasing the number taking one or two courses.

§Explicit tracking of individuals into vocational or academic programs or into accelerated and regular courses, and limitations on entry to special area high schools or programs are examples of potential barriers.

1. *Distinct job skills* that are of immediate use in the labor market, for example, typing, computer programming, or expertise in auto mechanics
2. *General learning skills* that enable individuals to learn job skills rapidly and adjust quickly to changing job demands
3. *Behavioral skills*, such as discipline, good work habits, and the ability to perform in a competitive, regimented environment

Vocational education presumably puts the most emphasis on teaching distinct job skills, whereas academic subjects presumably have a comparative advantage in teaching general learning skills. Academic and vocational courses may not differ systematically in their instruction in behavioral skills. Of course, particular vocational or academic courses may excel in all three areas.

Within this framework, the economic benefits of a high school education are a function of the total level of skills acquired in each category. A large estimate of the rate of return to schooling does not necessarily imply that vocational education teaches distinct job or general learning skills. These returns could be generated solely by academic training or behavioral skills that are taught in either curriculum. However, if we accept the hypothesis that courses in mathematics, sciences, English, and other academic subjects teach distinct job or general learning skills, then estimates of the relative effect of vocational education $(\Theta - \delta)$ in equation (3) provide a test of whether or not vocational education provides unique market skills.* Estimates of $(\Theta - \delta)$ that are close to zero provide evidence that academic and vocational skills are valued *equally* in the labor market. Under these conditions the hypothesis that vocational education conveys no unique skills automatically implies that academic courses also convey no unique skills.

Although academic or vocational coursework may be relatively more or less valued in the labor market, evaluated over the lifetime of the individual, our characterization of the two curricula imply vastly different earnings profiles over time. To illustrate, make the strong assumption that vocational education teaches only distinct job skills and behavioral skills, and academic courses teach only general learning skills and behavioral skills. It is also most realistic to assume that academic and vocational students work in different occupations, which offer different opportunities for on-the-job training. Jobs that offer significant opportunities for on-the-job training will be referred to as Type I jobs. Jobs that offer less opportunity for such training will be called Type II jobs. The implications of these assumptions are illustrated in figure 14-1 of the earnings profiles of vocational and academic students in different occupations.

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*The hypothesis that academic or vocational courses teach unique skills not available in other courses cannot be directly tested with the type of data used in this paper.

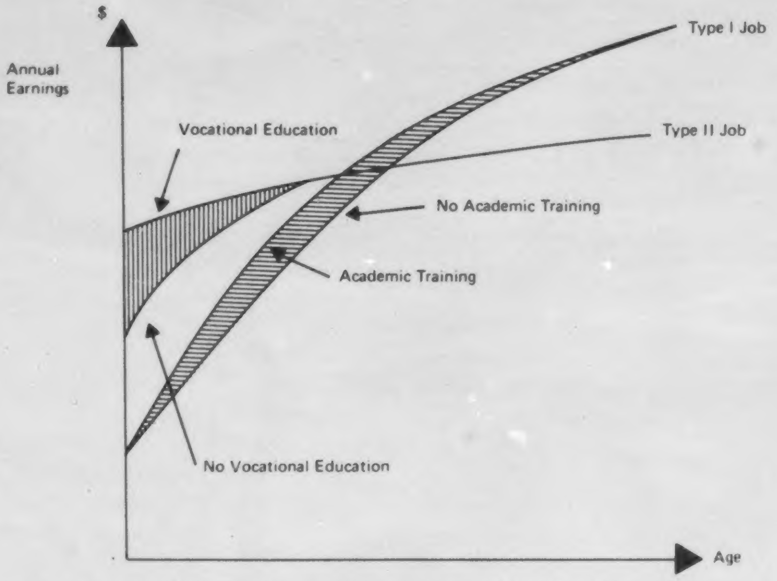

Figure 14-1. Age earnings profiles for individuals in different occupations and with different training.

For those individuals in Type II occupations, vocational education students have an earnings profile that is initially higher than the profile for students without vocational education. The difference represents less on-the-job training costs for those individuals with distinct job skills that were acquired in high school.* Similarly, in Type I occupations, academic students learn job skills at a faster rate than nonacademic students, thus lowering their cost of training. Vocational students in Type II occupations and academic students in Type I occupations will have radically different earnings profiles even though their lifetime incomes may be of equal value.* The model can easily be generalized to a large number of occupations characterized by different opportunities for on-the-job training.

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*Gustman and Steinmeier (1980) analyzed this possibility.

This analysis implies that vocational education should be evaluated on the basis of lifetime earnings profiles rather than on the basis of a single estimate of the effect of vocational education.† Unfortunately, almost all previous evaluations of vocational education have ignored the possibility of differences over time in earnings effects. Such differences can be compared by calculating the present discounted value of earnings differentials over the life of the individual: ‡

$$PV = \sum_{t=0}^{T} \frac{\Delta Y_t}{(1+r)^t} \tag{4}$$

ΔY_t is the difference in earnings in year t, and r is the rate at which earnings are discounted back to the present.

Finally, we consider the fact that many individuals do not enter the labor market directly after high school, but rather attend postsecondary vocational school, college, or graduate school. The relative value of vocational education may differ substantially depending on the individual's postsecondary activity. Students with distinct job skills acquired in vocational education may effectively diminish the value of their vocational training by entering the labor market for college graduates. Moreover, students without substantial academic training may gain less from college than individuals with more academic training. The issue is important since individuals with differing levels of vocational education are found in *all* four postsecondary activities (Meyer 1981c). For policy purposes, the average value of vocational education over all four labor markets is a more relevant measure of its effectiveness than an evaluation based on a single labor market.* This can be written symbolically as:

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* If discount rates are not the same for all individuals, then only some individuals will consider the alternative income streams equally attractive. Individuals with high discount rates will prefer income sooner, rather than later.

† Other factors, in addition to the ones mentioned here, may also contribute to differences in earnings profiles, for example, different rates of skill obsolescence, differences in implicit long-term contracts, and differences in the role of seniority in collective bargaining agreements.

‡ Hanoch (1967) constructed estimates of earnings profiles associated with different levels of schooling. He produced estimates of the internal rate of return attributable to changes in the number of years of schooling.

$$\text{(5)} \quad \overline{PV} = \sum_{i=1}^{4} p_i PV_i$$

where $\overline{PV}$ is the average valuation of vocational education, PV_i is the present value of earnings differentials in the ith postsecondary activity, and p_i is the percentage of the population in the ith activity. This formulation implies that if vocational education has a relatively negative effect on the income of college graduates, it could be counterbalanced, more or less, by a positive effect in other postsecondary activities. In fact, if an equilibrium is reached, differences in expected benefits from vocational education are likely to be exactly offsetting for those individuals on the margin.† Consequently, evidence that vocational education generates economic gains in a particular labor market does not, by itself, prove that, overall, individuals would gain from additional vocational education. This conclusion depends on evidence from all labor markets. Following most of the previous research on vocational education, this paper will focus on the economic effects of vocational education for individuals who directly enter the labor force after high school. In future work, we will examine the effects of vocational education in alternative labor markets and obtain estimates of the average valuation of vocational education, $\overline{PV}$.

The analysis in this section has reached three main conclusions that will influence the empirical analysis in the next two sections.

1. We should evaluate the economic benefits of vocational education on the basis of differences in the present value of lifetime income, rather than on differences in income for a single arbitrary year.
2. We should test the hypothesis that there are differences in earnings profiles between individuals with different levels of vocational education. This is implied by the assumption that vocational education emphasizes teaching distinct job skills as opposed to general learning skills.
3. Estimates of the effect of vocational education in individual labor markets (e.g., the labor markets for high school or college graduates)

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*However, knowledge of the effectiveness of vocational education in different labor markets is an important source of information for designing vocational education for different types of people with different interests and needs.

†Equilibrium is defined here as a situation in which individuals have no economic incentive to change their level of vocational coursework.

are only one part of the overall evaluation of vocational education in the labor market. A complete evaluation of vocational education depends on evidence of the relative effectiveness of vocational education in all labor markets.

AVERAGE LABOR MARKET OUTCOMES BY RACE AND SEX

The empirical analysis is based on the National Longitudinal Survey of the High School Class of 1972 (NLS72), a data set that consists of a single cohort of 23,000 men and women, all of whom were seniors in the spring of 1972. Individuals were sampled randomly from about 1,300 high schools. Schools were selected as a stratified random sample in order to overrepresent minority and disadvantaged students.

Theoretical considerations suggest that it is important to have observations on the earnings of individuals throughout their lifetime. Most longitudinal data sets fail to satisfy this requirement, and the NLS72 is no exception. However, annual data on wages, hours, earnings, and weeks worked are available for eight consecutive years after high school graduation. Our analysis is based on these eight years of data.

Individuals were asked to report their hours and weekly earnings in October, and the number of weeks employed from October to October of each year. Wages and earnings have been deflated by the October Consumer Price Index for each year so that changes over time in income reflect real, as opposed to nominal, earnings growth. Although we allow vocational education to have different effects on the three components of annual earnings: hourly wages, weekly hours, and annual weeks worked, these estimates are combined to obtain a single estimate of the effect of vocational education on annual earnings. Individuals were also asked to estimate their calendar year earnings from January through December of each year. Since individuals were surveyed in October this estimate of annual earnings is, in part, based on a forecast of individual earnings in the fourth quarter. Estimates based on this model are likely to be less reliable than our other estimates. Nevertheless, they provide a convenient check on the consistency of the empirical results.

Vocational education is defined as the number of courses in vocational subjects as a percentage of total courses. In a previous paper that analyzed a variety of measures of vocational education, we concluded

TABLE 14-1

Average Weekly Earnings and Annual Weeks Worked by Level of Participation in Vocational Education

Vocational Level by Group	*Weekly Earnings ($ 1972)*				*Annual Weeks Worked*			
	1972	*1974*	*1976*	*1979*	*1973*	*1974*	*1976*	*1979*
Women								
Low	74.51	87.57	87.73	86.21	32.54	30.78	29.24	32.44
0-15	(36.70)	(37.80)	(37.65)	(40.01)	(19.42)	(20.98)	(21.82)	(21.67)
	616	576	557	488	892	882	848	607
Medium	75.37	86.01	94.04	89.99	33.71	31.80	31.12	32.61
15-35	(33.24)	(30.95)	(39.77)	(42.09)	(18.95)	(21.07)	(21.53)	(21.66)
	754	741	709	650	1,108	1,104	1,073	831
High	81.91	89.47	98.78	92.74	37.51	35.76	34.31	33.84
35+%	(32.15)	(27.47)	(36.97)	(40.58)	(18.14)	(20.36)	(21.28)	(21.81)
	984	930	877	725	1,282	1,264	[illegible]	962
Men								
Low	105.10	130.33	140.23	151.56	40.86	44.57	44.64	47.27
0-15	(48.53)	(58.84)	(55.18)	(61.73)	(15.73)	(13.47)	(13.12)	(10.52)
	505	531	523	341	614	560	557	352
Medium	108.73	129.28	141.52	152.92	41.80	45.20	44.91	47.63
15-35	(51.94)	(54.72)	(57.59)	(63.03)	(15.25)	(12.70)	(13.06)	(10.46)
	870	937	947	656	1,043	983	972	674
High	114.05	133.54	146.04	159.40	42.17	44.20	44.89	47.42
35+%	(51.45)	(56.73)	(62.25)	(67.01)	(14.50)	(13.37)	(12.74)	(10.35)
	1,115	1,167	1,154	843	1,263	1,219	1,216	878

NOTE: For each year, average earnings have been deflated by the October Consumer Price Index (CPI) to October 1972 dollars.

Standard errors are in parentheses below each mean. The sample size for each statistic is below the standard error. The vocational level for women does not include courses in home economics. The sample includes individuals with twelve years of schooling as of 1976. A number of individuals who attended school for the first time after 1976 were also excluded from the 1979 calculations.

that a measure of vocational education based on actual course enrollment data provided the best measure of participation in vocational education. Categorical measures of vocational education, which have been used extensively in previous research on vocational education, were found to be prone to substantial measurement error. In particular, many individuals identified as being in an academic program were found to take more vocational coursework than individuals in a vocational program. The premise that individuals fit neatly into one of four *standard* programs (e.g., an academic, general, commercial, or technical program) appears to be false (Meyer 1981a).*

Table 14-1 presents calculations of average weekly earnings and average annual weeks worked by level of vocational coursework for selected years over the period 1972 to 1979. Individuals are grouped into three categories on the basis of their vocational coursework: (1) low participation in vocational education, 0 to 15 percent, (2) medium participation, 15-35 percent, and (3) high participation, 35 percent and over. Of course, differences in earnings and employment depend on a variety of other factors such as ability, motivation, and family background. Consequently, differences in unconditional means cannot be attributed solely to differences in vocational education. Nevertheless, simple averages of earnings and employment provide a rough idea of whether or not vocational education has any effects in the labor market. Causal estimates of the effect of vocational education on income will be presented in the next section.

Results for all women are presented in the top half of table 14-2 and in table 14-3 for black, Hispanic, and white women. In general, vocational education seems to be associated with gains in weekly earnings and weeks worked, although differences in employment vanish by 1979. Employment differences associated with vocational education seem to be much larger for Hispanic women than for black and white women. In 1976, Hispanic women in the high category worked forty-two weeks a year, compared with thirty-two weeks a year in the low category, a difference of ten weeks a year. Comparable differences between the high and

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*A measure of vocational education based on the level of vocational coursework also permits a number of new questions to be asked: Does the intensity or level of vocational education affect earnings? Are these effects diminishing or increasing with the level of vocational education? Are there interactions between coursework in vocational subjects, math, science, and English?

Although we will not comment extensively on the results, Appendix table A.4 presents econometric estimates of earnings and weeks worked equations for alternative definitions of vocational education. See also, Meyer (1981b).

TABLE 14-2

Average Weekly Earnings and Annual Weeks Worked by Level of Participation in Vocational Education

Vocational Level by Group	*Weekly Earnings ($ 1972)*				*Annual Weeks Worked*			
	1972	*1974*	*1976*	*1979*	*1973*	*1974*	*1976*	*1979*
Black Men								
Low	99.67	121.00	125.82	123.68	36.18	39.33	43.53	45.56
0-15	(49.31)	(64.30)	(56.01)	(60.98)	(17.97)	(18.49)	(14.85)	(13.61)
	87	86	89	55	110	100	94	57
Medium	101.69	118.51	125.25	129.08	37.98	44.41	44.07	45.91
15-35	(53.03)	(52.36)	(55.35)	(55.26)	(17.85)	(13.48)	(14.19)	(13.26)
	166	181	183	129	208	189	181	128
High	109.41	120.75	119.24	138.05	37.00	41.03	40.53	44.87
35+%	(46.35)	(55.14)	(54.93)	(61.76)	(17.71)	(15.89)	(17.39)	(14.22)
	121	142	141	95	153	154	155	95
Hispanic Men								
Low	87.00	112.57	124.00	152.66	41.62	44.89	48.26	43.62
0-15	(36.45)	(45.73)	(45.24)	(48.31)	(14.40)	(12.86)	(10.96)	(17.15)
	22	24	27	15	29	27	23	16
Medium	105.30	125.69	135.72	148.10	41.64	45.26	45.16	47.55
15-35	(69.10)	(56.32)	(58.54)	(50.03)	(15.67)	(11.74)	(13.12)	(11.70)
	40	49	50	31	50	53	51	29
High	108.26	131.21	144.17	149.84	34.65	38.82	43.00	47.28
35+%	(51.22)	(61.12)	(68.62)	(74.38)	(19.40)	(18.54)	(13.75)	(12.41)
	55	65	59	49	69	66	62	53
White Men								
Low	107.31	133.25	144.46	157.16	41.90	45.76	44.69	48.39
0-15	(48.73)	(58.08)	(54.98)	(61.19)	(15.08)	(11.78)	(12.82)	(9.17)
	396	421	407	271	475	433	440	279
Medium	110.69	132.28	146.09	159.43	42.82	45.40	45.10	48.06
15-35	(50.39)	(54.91)	(57.37)	(64.21)	(14.31)	(12.56)	(12.78)	(9.54)
	664	707	714	496	785	741	740	517
High	114.98	135.59	150.12	162.97	43.43	45.04	45.68	47.76
35+%	(52.08)	(56.46)	(61.93)	(66.64)	(13.24)	(12.36)	(11.65)	(9.53)
	939	960	954	699	1,041	999	999	730

TABLE 14-3

Average Weekly Earnings and Annual Weeks Worked by Level of Participation in Vocational Education

Vocational Level by Group	*Weekly Earnings ($ 1972)*				*Annual Weeks Worked*			
	1972	*1974*	*1976*	*1979*	*1973*	*1974*	*1976*	*1979*
Black Women								
Low	74.98	88.32	88.62	90.44	27.09	27.90	29.48	35.29
0-15	(36.55)	(41.77)	(39.28)	(38.19)	(20.04)	(20.44)	(21.61)	(20.56)
	107	115	126	98	162	178	172	117
Medium	77.26	86.94	93.98	97.44	27.48	26.99	32.29	40.19
15-35	(31.81)	(33.42)	(36.88)	(49.83)	(19.46)	(21.67)	(21.21)	(18.52)
	97	112	133	120	172	174	171	134
High	86.08	92.24	103.24	91.98	30.75	32.75	36.47	35.36
35+%	(29.60)	(27.15)	(42.48)	(35.97)	(20.51)	(20.34)	(20.68)	(20.90)
	90	95	98	65	130	126	119	77
Hispanic Women								
Low	65.19	87.71	81.53	86.73	27.76	29.04	32.26	36.73
0-15	(39.76)	(37.88)	(22.06)	(23.58)	(19.30)	(21.49)	(22.48)	(19.34)
	26	30	25	22	46	44	38	25
Medium	75.06	88.73	99.97	84.24	29.47	29.73	31.83	35.00
15-35	(46.80)	(34.80)	(41.44)	(36.19)	(19.05)	(21.19)	(20.90)	(20.20)
	34	39	38	35	55	52	52	40
High	88.34	94.36	103.10	90.13	35.23	38.80	41.97	38.34
35+%	(33.08)	(26.64)	(32.82)	(35.03)	(19.13)	(18.71)	(16.74)	(17.99)
	44	53	51	43	62	64	58	50
White Women								
Low	74.91	87.36	87.83	85.05	34.15	31.69	28.99	31.49
0-15	(36.58)	(36.76)	(37.93)	(41.24)	(19.02)	(21.04)	(21.86)	(22.01)
	483	431	406	368	684	660	638	465
Medium	75.09	85.66	93.64	88.60	35.19	32.88	30.85	30.91
15-35	(32.62)	(30.23)	(40.37)	(40.26)	(18.57)	(20.82)	(21.64)	(22.02)
	623	590	538	495	881	878	850	657
High	81.14	88.80	97.88	93.00	38.45	35.93	33.65	33.43
35+%	(32.33)	(27.54)	(36.43)	(41.44)	(17.60)	(20.44)	(21.49)	(22.08)
	850	782	728	617	1,090	1,074	1,058	835

low categories in 1976 were seven weeks and five weeks for black women and white women, respectively. These gains were almost completely eroded by 1979 for all ethnic groups.

For all three ethnic groups, differences in earnings seemed to fluctuate over time. In general, earnings differentials tended to be quite large in 1972 and in 1976. For example, in 1972 Hispanic women in the high category earned $23 more per week than individuals in the low category. After 1972, however, earnings differentials fell rapidly for Hispanic women. In 1979, differences in earnings for high and low individuals were $2, $4, and $8, for black, Hispanic, and white women, respectively.

The results for men were quite different. Vocational education was associated with both large gains and large losses for Hispanic men. Differences in weekly earnings between individuals in the high and low categories ranged from $9 to $21 over the years 1972, 1974, and 1976. By 1979, however, the earnings differential was negative. Comparable employment differentials were large and negative for Hispanic men, with the exception of 1979. In 1973, Hispanic men in the high category worked seven fewer weeks than individuals with less vocational education. Employment differentials were somewhat negative for black men and essentially zero for white men throughout the period. Earnings differentials fluctuated between positive and negative values for both black and white men.

In the next section we will present estimates of the effect of vocational education on wage rates, hours, and annual weeks worked, controlling for other important determinants of these outcomes.

EMPIRICAL ESTIMATES OF THE RELATIVE EFFECTS OF VOCATIONAL EDUCATION ON INCOME

Most of the previous research on vocational education has defined the high school curriculum in terms of mutually exclusive, categorical variables (e.g., academic, general, commercial, or technical programs). In the previous section, however, we argued that it is preferable to define vocational education on the basis of actual course enrollment data (also see Meyer 1981a). In this latter formulation, new empirical issues arise. First, we can test the hypothesis that the effect of vocational education on earnings and employment is nonlinear, that is, increasing or decreasing with the level of vocational education. Second, vocational education may interact with other subjects in the determination of earnings and employment, for example, mathematics, science, and English. Of course, the interpretation of the estimated effect of vocational education on income will be highly dependent on which course variables are included in the equation. In the results reported in this paper, measures of vocational education are the only course variables that are included in the equations. Thus, the coefficient on the percentage of courses taken in vocational education should be interpreted as the change in income that is associated with an increase in vocational coursework *and* an equivalent decrease in academic coursework.*

The estimates reported in all tables are based on a specification that includes individual ability, class rank, parents' income, marital status, number of dependents, area wages and unemployment, high school work experience, and a set of regional indicators. For the most part these variables are determined prior to, or independently of, vocational education. On the other hand, we have excluded accumulated work experience, a measure of on-the-job training, job tenure, and a union indicator from the specification because these variables are likely to be determined, in part, by vocational education. The previous theoretical discussion suggested the existence of an important link between the level of vocational education and subsequent on-the-job training. Although estimates of the complete equations are of interest in their own right, we will focus primarily on the results pertaining to vocational education. Estimates of the complete equations for selected years are presented in Appendix tables A-1 and A-2 for women and men. Simple statistics for all variables are given in Appendix table A-4. The tables presented in the text contain estimates of the effect of vocational education on log wages, log hours, and annual weeks worked. Together, these three outcomes determine annual income. We also present estimates based on an alternative measure of annual income to provide a check on the consistency of the empirical results.†

Estimates of the effects of vocational education on women are presented in table 14-4. Three different types of vocational education were distinguished: commercial, technical,‡ and home economics. Commercial

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* Since all individuals in our data set are high school graduates and take approximately the same number of courses, vocational coursework can only be increased at the expense of academic coursework.

The effect of an increase in vocational education (decrease in academic coursework) of 20 percentage points can be found by multiplying our vocational education coefficients by 0.20.

† See the section on Average Labor Market Outcomes by Race and Sex for a discussion of the different labor market outcomes.

‡ Technical subjects include trade, industrial arts, agriculture, health, and distributive education.

TABLE 14-4

Estimates of the Effects of Vocational Education on Labor Market Outcomes
Women

	1972	*1973*	*1974*	*1975*	*1976*	*1977*	*1978*	*1979*
Log Wage Eq.								
Commercial	0.1754** (0.0449)	0.1599** (0.0461)	0.0551 (0.0404)	0.0129 (0.0442)	0.1567** (0.0430)	0.0595 (0.0521)	0.0825 (0.0523)	0.0412 (0.0555)
Technical	0.3530** (0.1159)	0.2198* (0.1209)	-0.1143 (0.1019)	-0.1953* (0.1129)	-0.0914 (0.1115)	0.0290 (0.1428)	-0.1233 (0.1417)	-0.1134 (0.1504)
Home Economics	0.0060 (0.1165)	-0.0534 (0.1199)	-0.1276 (0.1030)	-0.3449** (0.1113)	-0.4014** (0.1077)	-0.3804** (0.1288)	-0.4225** (0.1298)	-0.5153** (0.1367)
R^2	0.0715	0.0815	0.0916	0.0955	0.1261	0.0829	0.0944	0.1004
Sample	1,813	1,757	1,797	1,804	1,765	1,452	1,456	1,412
Log Hours Eq.								
Commercial	0.1109** (0.0476)	0.0302 (0.0390)	0.0406 (0.0336)	0.0752** (0.0380)	0.1423** (0.0400)	0.0084 (0.0454)	0.0362 (0.0480)	0.1042* (0.0581)
Technical	-0.3304** (0.1228)	-0.1081 (0.1024)	-0.0518 (0.0847)	-0.1496 (0.0971)	0.0505 (0.1039)	0.0925 (0.1242)	0.0594 (0.1299)	0.1049 (0.1573)
Home Economics	0.0778 (0.1235)	0.1237 (0.1016)	0.0206 (0.0856)	-0.0482 (0.0957)	0.1061 (0.1004)	-0.1309 (0.1120)	0.0647 (0.1191)	0.2346 (0.1430)
R^2	0.0425	0.0236	0.0340	0.0230	0.0283	0.0340	0.0573	0.0419
Sample	1,813	1,757	1,797	1,804	1,765	1,452	1,456	1,412

TABLE 14-4, continued

	1972	*1973*	*1974*	*1975*	*1976*	*1977*	*1978*	*1979*
Weeks Worked Eq.								
Commercial	–	8.0364**	8.9275**	12.0211**	10.6892**	6.3166**	7.4002**	2.8991
	–	(2.0429)	(2.1538)	(2.3832)	(2.3132)	(2.8277)	(2.7983)	(2.8278)
Technical	–	-4.9843	-1.5007	10.6620*	4.1391	-9.5097	-3.4137	-9.8187
	–	(5.1063)	(5.2546)	(5.9744)	(5.8838)	(7.3343)	(7.2664)	(7.3403)
Home	–	-5.6015	-2.5420	1.7073	-2.8013	-4.9113	-5.5199	-3.3233
Economics	–	(5.0869)	(5.2962)	(5.9052)	(5.7167)	(6.9776)	(6.8944)	(6.9218)
R^2	–	0.1877	0.1830	0.1170	0.1402	0.1121	0.1298	0.1347
Sample	–	2,431	2,643	2,575	2,624	1,966	1,965	1,854
Annual Income								
Commercial	–	1278.285**	1282.068**	1480.162**	1542.34**	1195.823**	1312.702**	622.9515
		(344.6485)	(258.7165)	(289.612)	(303.8967)	(378.3249)	(395.8181)	(412.2374)
Technical	–	-116.8872	861.2560	642.6248	-170.5490	-1154.41	-1040.83	-540.5251
		(933.6934)	(635.9072)	(723.6553)	(768.5397)	(995.1213)	(1051.701)	(1100.075)
Home	–	355.4147	-536.3367	-871.7802	-1234.69	-1692.99**	-726.0629	-507.7139
Economics		(852.3285)	(643.4977)	(728.2574)	(760.6394)	(928.5117)	(975.4532)	(1012.953)
R^2	–	0.1738	0.1471	0.1046	0.1126	0.1029	0.1012	0.0970
Sample	–	1,087	2,362	2,503	2,510	1,909	1,913	1,779

NOTE: The regressions for 1972-1976 include individuals with twelve years of schooling as of 1976. A number of individuals who attended school for the first time after 1976 were also excluded from the 1977-1979 regressions. Standard errors are in parentheses. The regressions also include the set of variables listed in Appendix table A.1.

* indicates significance at the .10 level

** indicates significance at the .05 level

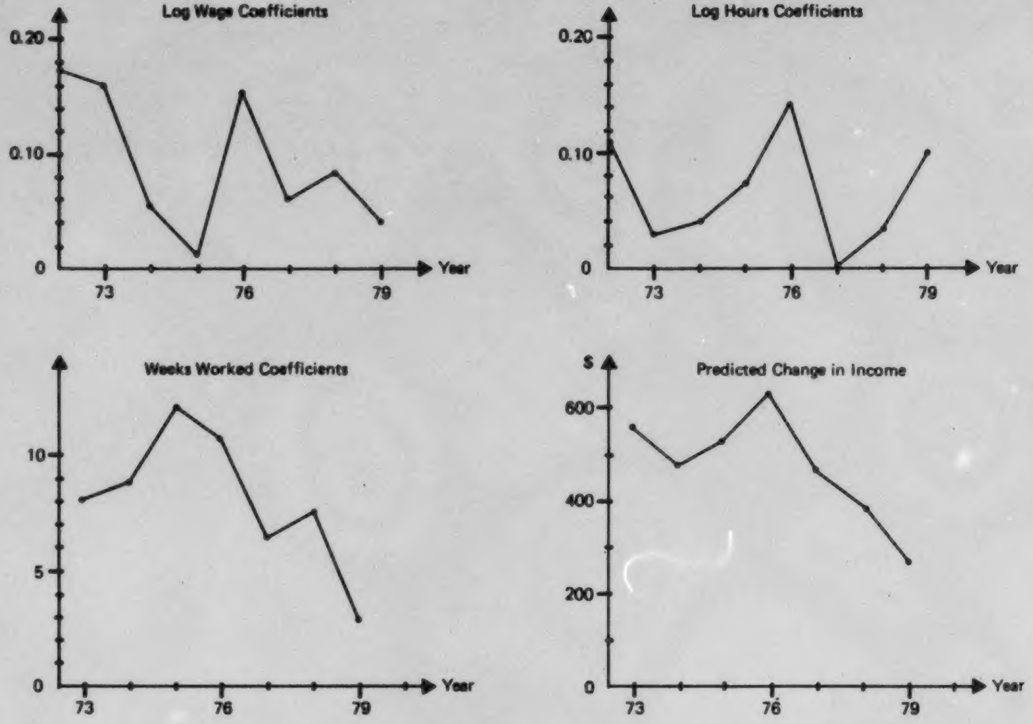

Figure 14-2. The effect of commercial courses on wages, hours, and weeks worked — women.

SOURCE: Table 14-5

coursework is by far the dominant vocational subject for women. Over 80 percent of all women take some commercial coursework.* In our sample, the average level of commercial coursework was 29 percent.

The evidence in table 14-4 strongly suggests that commercial courses raise the income of women during the first decade after high school. Although the estimates for technical and home economics courses are frequently imprecise, it seems likely that coursework in home economics is associated with a significant decrease in income, *throughout* the period 1972 to 1979. Coursework in technical subjects tended to generate some gains in wages in 1972 and 1973 and losses throughout the remaining six years. The effect of technical coursework on employment is uniformly negative. This latter finding may reflect difficulties faced by women in obtaining employment in fields traditionally dominated by men.

The effects of commercial coursework on wages, hours, and weeks worked follow a general pattern that is quite consistent with the theoretical model presented previously. In 1972 an increase in commercial coursework of 40 percentage points (about two standard deviations) stimulated an increase in wages of 7 percent, an increase in hours worked of 4.5 percent, and an increase in employment of three weeks per year. By 1979 these effects had declined substantially. An identical increase in commercial coursework was associated with an increase in wages of 1.5 percent and an increase in employment of one week per year. These effects are presented graphically in figure 14-2. Although the effect of commercial courses on weekly hours is somewhat unstable, the effects on wages and employment clearly decline over time.†

These results are quite consistent with the hypothesis that individuals initially receive significant economic benefits from acquiring distinct commercial skills in vocational education. Furthermore, these benefits decline over time, as predicted by the model. Since we observe only eight years of a typical forty- to forty-five-year working life, we are not yet able to observe whether or not negative earnings differentials arise between individuals with different amounts of commercial education. Confirmation of this theoretical prediction will have to await the availability of additional data.

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*See Meyer (1981a) for a detailed analysis of the typical course profiles for men and women.

† The fact that the coefficients exhibit some instability is to be expected since they are *estimates* of unknown population parameters with some variance. This lends additional support to the strategy of evaluating vocational education on the basis of a large number of years.

Estimates of the effects of vocational education on men are presented in table 14-5. Three different types of vocational education were distinguished: commercial, trade and industrial arts, and other technical courses. The first three subjects are the big vocational fields for men. Over 60 percent of all men take some coursework in trade and industrial arts. Somewhat less than 60 percent of all men take commercial courses. As is evident in table 14-5, the results for men are much less clear-cut than is the case for women. The standard errors of the coefficient estimates are fairly large. Thus, the estimates are quite unstable and few coefficients are statistically significant by conventional standards. The coefficients for trade and industrial arts and for commercial courses are also presented in figures 14-3 and 14-4, respectively.

The commercial coefficients tend to fluctuate fairly randomly around zero. They fail to provide evidence that commercial coursework has a large and systematic effect on income. Apparently, men with commercial training do not take (or are unable to take) jobs that allow them to make major use of their vocational training. On the other hand, the pattern of coefficients for trade and industrial arts roughly supports the notion that these courses generate initial income gains for men. Wage effects are quite large for the first few years after high school. Results based on the alternative measure of annual income confirm the pattern of large but declining benefits of coursework in trade and industrial arts. In fact, by 1979, trade and industrial arts had a negative (although statistically insignificant) effect on annual income.

In the remainder of the paper we summarize our empirical results for men and women in terms of the present value of the income differentials associated with different levels of coursework in each vocational subject. Since our data span a total of eight years, or about 20 percent of the working life of a typical individual, these estimates obviously do not incorporate information on the entire income profile associated with different course levels. Consequently our estimates of the present value of income differentials will appear to be high for those vocational fields that follow the theoretically predicted pattern of large initial, and subsequent declining, economic benefits. Commercial courses for women and trade and industrial arts courses for men fall into this category.

Two different estimates of the effect of vocational education on annual income have been used in this analysis. Our primary results are based on empirical estimates of the wages, hours, and employment equations presented in tables 14-4 and 14-5. The effects of vocational education on these three components of income are combined to obtain a

TABLE 14-5

Estimates of the Effects of Vocational Education on Labor Market Outcomes Men

	1972	*1973*	*1974*	*1975*	*1976*	*1977*	*1978*	*1979*
Log Wage Eq.								
Commercial	0.0309 (0.0793)	0.0420 (0.0797)	-0.1739** (0.0792)	-0.0242 (0.0775)	-0.0599 0.0767	0.0612 (0.0936)	0.1337 (0.0953)	0.1280 (0.0991)
Trade & Industrial Arts	0.2055** (0.0549)	0.0815 (0.0557)	0.0497 (0.0559)	0.0743 (0.0540)	0.0929* (0.0525)	0.0074 (0.0664)	0.0871 (0.0665)	0.0706 (0.0690)
Other Technical	0.3903** (0.1156)	0.1094 (0.1186)	-0.2518** (0.1119)	-0.0241 (0.1076)	-0.1969* (0.1079)	0.1146 (0.1271)	-0.0678 (0.1279)	-0.1781 (0.1311)
R^2	0.0436	0.0691	0.1016	0.0826	0.1174	0.1096	0.1277	0.1449
Sample	1,891	1,825	1,977	2,003	2,084	1,422	1,429	1,372
Log Hours Eq.								
Commercial	0.0962 (0.0666)	-0.0570 (0.0476)	0.0256 (0.0444)	0.0095 (0.0397)	0.0159 (0.0382)	-0.0053 (0.0417)	-0.0603 (0.0395)	-0.0444 (0.0472)
Trade & Industrial Arts	0.0559 (0.0461)	0.0644* (0.0333)	0.0294 (0.0313)	-0.0117 (0.0276)	-0.0531** (0.0262)	-0.0179 (0.0296)	-0.0223 (0.0276)	-0.0026 (0.0328)
Other Technical	-0.0128 (0.0971)	0.0950 (0.0709)	0.0760 (0.0627)	0.0359 (0.0551)	0.0396 (0.0537)	-0.0200 (0.0567)	0.0166 (0.0530)	0.1313** (0.0624)
R^2	0.0292	0.0438	0.0485	0.0237	0.0381	0.0324	0.0453	0.0517
Sample	1,891	1,825	1,977	2,003	2,084	1,422	1,429	1,372

TABLE 14-5, continued

	1972	*1973*	*1974*	*1975*	*1976*	*1977*	*1978*	*1979*
Weeks Worked Eq.								
Commercial	–	1.0811 (3.0336)	0.8594 (2.4641)	-2.2645 (2.6752)	1.3428 (2.5302)	5.3395* (2.8190)	3.6234 (2.6767)	1.8346 (2.6062)
Trade & Industrial Arts	–	3.3753 (2.1051)	-1.2317 (1.7505)	1.9657 (1.8466)	0.7075 (1.7437)	2.4780 (1.9733)	0.1038 (1.8745)	-0.3777 (1.8015)
Other Technical	–	6.3600 (4.4751)	-0.1501 (3.5409)	5.1606 (3.6990)	2.5160 (3.4965)	2.7750 (3.7796)	-1.4203 (3.5684)	-0.9068 (3.4388)
R^2	–	0.0997	0.0628	0.0686	0.0547	0.0407	0.0344	0.0497
Sample	–	2,022	2,234	2,160	2,249	1,531	1,534	1,461
Annual Income								
Commercial	–	258.9923 (761.6318)	175.9560 (567.6735)	88.5688 (605.9548)	120.2276 (622.8759)	1292.2590 (853.5290)	336.9118 (906.4548)	-52.3207 (911.2219)
Trade & Industrial Arts	–	1478.1510** (526.9718)	742.2461* (398.5082)	667.0988 (420.3137)	845.0077** (427.9745)	670.2267 (598.3049)	258.8872 (636.0003)	-449.3947 (633.4236)
Other Technical	–	1472.411 (1106.5190)	-279.3533 (818.6724)	928.2342 (835.9739)	-110.9021 (855.6780)	518.5247 (1160.9190)	66.9721 (1226.4730)	-620.8011 (1215.3230)
R^2	–	0.1146	0.1264	0.1006	0.1164	0.1307	0.1398	0.1542
Sample	–	1,207	2,130	2,149	2,215	1,446	1,448	1,377

*** indicates significance at the .10 level**
**** indicates significance at the .05 level**

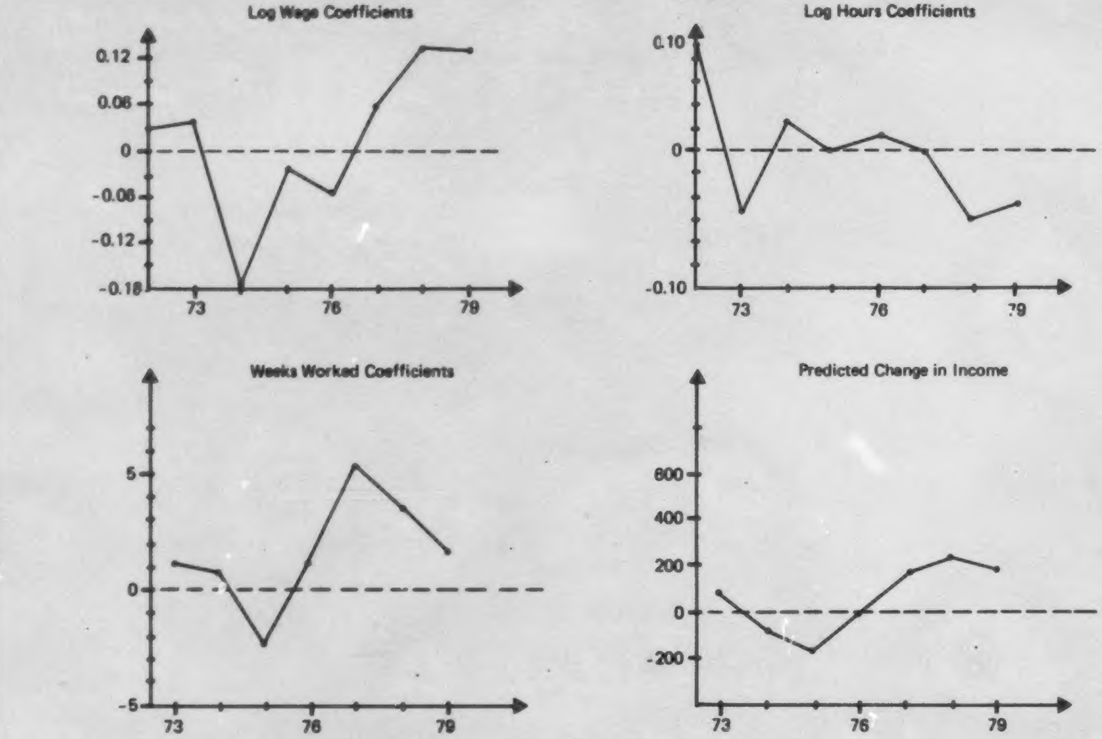

Figure 14-3. The effect of commercial courses on wages, hours, and weeks worked — men.

SOURCE: Table 14-5

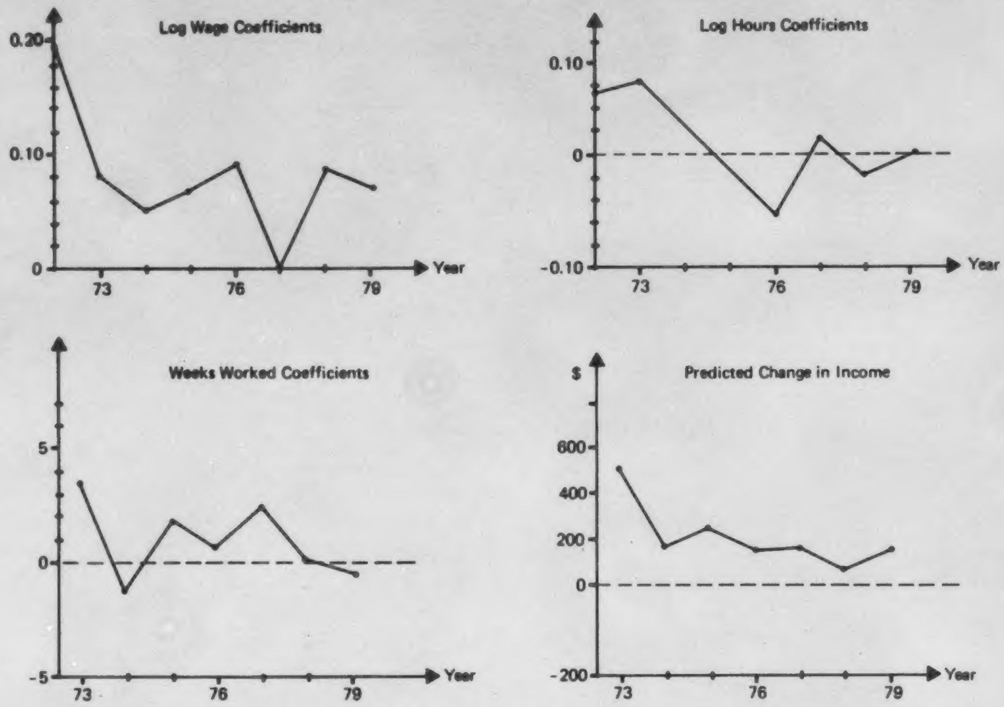

Figure 14-4. The effect of trade and industrial arts on wages, hours, and weeks worked — men.

SOURCE: Table 14-5

single estimate of the effect of vocational education on annual income.* These estimates are presented for each year in the lower right side of figures 14-2, 14-3, and 14-4.

Secondary results are based directly on estimates of the effect of vocational education on annual income presented in the bottom of tables 14-4 and 14-5. The measure of annual income used in these equations is different, in several respects, from the value of annual income implied by the three components of income: wages, hours, and weeks worked.† In large enough samples, though, we expect both approaches to give comparable results. The income profiles generated by either approach can conveniently be summarized by calculating the present value of the differences in income generated by vocational education. To provide a more accurate idea of the size of the present value of the income differentials we have also calculated "standardized" estimates that divide the present value of income differentials by the present value of average income in each year. Standardized estimates measure the percentage change in total discounted income corresponding to an increase in vocational education.

Results for women and men are presented in tables 14-6 and 14-7, respectively. Results for blacks and Hispanics are presented in table 14-8. A two standard deviation increase in commercial coursework increases total discounted income by about 16 percent for women. Calculations based on the two different measures of income are in surprisingly close agreement. Over half of this effect can be attributed to increased employment. However, wage effects are responsible for an increase in discounted income of about 3.5 percent. Technical and home economics courses have a *negative* effect on discounted income, about 1 percent for the former and 4 percent for the latter.

In contrast, gains from vocational education in all three areas are uniformly small, but positive, for men. Commercial and technical courses increase discounted income by about 1 percent. Courses in trade and industrial arts increase discounted income by about 3.5 percent. Although estimates of these effects are quite imprecise for blacks and Hispanics, due

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* The procedure for calculating the combined effects of vocational education on calculated annual income is described in Appendix B. All estimates are based on a simulated increase in vocational education of two standard deviations. Appendix table A.4 contains means and standard deviations for each vocational course variable.

† See the previous section on Average Labor Market Outcomes by Sex and Race.

TABLE 14-6

Estimates of the Present Discounted Value of Annual Income Differentials Associated with Differences in Vocational Education, 1972-1979

Women

	Commercial	*Technical*	*Home Economics*
A. Present Discounted Value of Predicted Income Differentials ($)	3065	-318	-889
B. Standardized Value of Predicted Income Differentials (%)	15.74	-1.63	-4.56
C. Standardized Value of Predicted Income Differentials, Alternative Model (%)	16.25	-0.95	-3.52
D. Decomposition of Standardized Estimates in B. into Component Effects (%)			
1. Wage Effects	3.51	-0.24	-3.79
2. Hours Effects	2.39	-0.49	0.58
3. Employment Effects	9.21	-0.85	-1.38
4. Interactions	0.63	-0.06	0.02
5. Total (identical to B.)	15.74	-1.63	-4.56

NOTE: These calculations are based on the coefficients presented in table 14-4. The standardized value of income differentials is the present discounted value of income differentials reported on line A. as a percentage of the present discounted value of average income in each year.

to small sample sizes,* both black and Hispanic men appear to gain modestly from vocational education over this period. Hispanic women, however, appear to gain more from commercial coursework than either black or white women. Our estimates indicate the the discounted income of Hispanic women with high levels of commercial training may be 20 to 30

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* Insufficient data are the main reason that estimates of the economic effects of vocational education in table 14-8 vary somewhat between the primary and alternative models. In tables 14-6 and 14-7, when the sample sizes are much larger, the different estimates are surprisingly close.

TABLE 14-7

Estimates of the Present Discounted Value of Annual Income Differentials Associated with Differences in Vocational Education, 1972-1979

Men

	Commercial	*Trade & Industrial Arts*	*Other Technical*
A. Present Discounted Value of Predicted Income Differentials ($)	447	1372	305
B. Standardized Value of Predicted Income Differentials (%)	0.92	3.32	0.80
C. Standardized Value of Predicted Income Differentials, Alternative Model (%)	1.13	3.46	0.77
D. Decomposition of Standardized Estimates in B. into Component Effects (%)			
1. Wage Effects	0.25	2.55	-0.53
2. Hours Effects	-0.17	0.01	0.66
3. Employment Effects	0.84	0.73	0.68
4. Interactions	0.00	0.03	-0.01
5. Total (identical to B.)	0.92	3.32	0.80

NOTE: These calculations are based on the coefficients presented in table 14-5. The standardized value of income differentials is the present discounted value of income differentials reported on line A. as a percentage of the present discounted value of average income in each year.

percent higher over this period due to vocational education. On the other hand, there is evidence that Hispanic and black women who take high levels of home economics make substantially less income than individuals with less home economics.

TABLE 14-8

Estimates of the Present Discounted Value of Annual Income Differentials Associated with Differences in Vocational Education by Race, 1972-1979

WOMEN	*Commercial (%)*	*Technical (%)*	*Home Economics (%)*
Black			
B. Primary Model	1.95	-12.51	-12.75
C. Alternative Model	18.62	-10.57	-9.73
Hispanic			
B. Primary Model	33.19	7.19	-5.31
C. Alternative Model	22.97	2.76	-19.66
All			
B. Primary Model	15.74	-1.63	-4.56
C. Alternative Model	16.25	-0.95	-3.52

MEN	*All Vocational Courses (%)*
Black	
B. Primary Model	3.75
C. Alternative Model	-1.16
Hispanic	
B. Primary Model	6.21
C. Alternative Model	7.05

NOTE: These calculations are based on regression results not reported in the paper. They are available from the author on request.

CONCLUSIONS

Our empirical results tend to confirm the findings of Grasso and Shea (1979) that women gain substantially from commercial education, at least in the first decade after high school graduation. Commercial curriculum appear to teach distinct job skills that are highly valued in the labor market. However, evidence on the declining effectiveness of commercial coursework suggests that income differentials may eventually become negative. These findings are quite consistent with the predictions of the theoretical model included in this paper.

Modest effects of trade and industrial arts courses were also found for men. Here again, income gains were significant in the year immediately after graduation from high school. By 1979, however, the effect of vocational education was zero or negative.

Our analysis suggests two important topics for future research. First, data on earnings and employment over a longer age span would permit estimates to be made of the entire earnings profile associated with different levels of vocational education. Ideally, vocational education should be evaluated on the basis of its contribution to lifetime income, rather than on the basis of income effects in selected years. Second, the analysis should be extended to individuals in other labor markets, for example, the market for college graduates or graduates of postsecondary vocational schools. The overall evaluation of vocational education should depend on its effects in *all* labor markets. The evidence in this paper suggests that commercial education for women, and to a lesser degree, trade and industrial arts for men, generate positive benefits in the labor market for high school graduates, at least during the first decade following graduation from high school.

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APPENDIX TABLE A.1

Estimates of Models of Weekly Earnings and Annual Weeks Worked

Women

	Log Weekly Earnings			*Annual Weeks Worked*		
	1973	*1976*	*1979*	*1973*	*1976*	*1979*
Commercial	0.1900** (0.0515)	0.2990** (0.0593)	0.1454* (0.0800)	8.0364** (2.0429)	10.6892** (2.3132)	2.8991 (2.8278)
Technical	0.1117 (0.1350)	-0.0409 (0.1540)	-0.0085 (0.2167)	-4.9843 (5.1063)	4.1391 (5.8838)	-9.8187 (7.3403)
Home Economics	0.0703 (0.1340)	-0.2953** (0.1488)	-0.2807 (0.1970)	-5.6015 (5.0869)	-2.8013 (5.7167)	-3.3233 (6.9218)
High School Work Experience						
0-10 hours	-0.0179 (0.0257)	-0.0374 (0.0290)	-0.0276 (0.0379)	5.2462** (1.0011)	-1.7767 (1.1090)	-0.5422 (1.3197)
10-20 hours	-0.0071 (0.0244)	0.0244 (0.0278)	0.0178 (0.0375)	6.3013** (0.9620)	3.9676** (1.0973)	3.6996** (1.3211)
20+ hours	0.0425* (0.0245)	0.0495* (0.0277)	0.0616* (0.0369)	6.9197** (0.9461)	2.6331** (1.0750)	3.4397** (1.3076)
Black	0.0660** (0.0310)	0.0780** (0.0325)	0.1103** (0.0441)	-6.4022** (1.1890)	2.2137* (1.3336)	2.9666* (1.6145)
Hispanic	-0.0028 (0.0436)	0.0354 (0.0478)	0.0117 (0.0627)	-4.4202** (1.6815)	6.3980** (1.9565)	6.4644** (2.3387)
Test	0.0550* (0.0324)	0.0722** (0.0364)	0.1000** (0.0484)	1.6437 (1.2664)	4.4156** (1.4113)	4.0161** (1.7205)
Class Rank	0.0998** (0.0454)	0.0911* (0.0514)	0.0786 (0.0671)	8.1330** (1.7826)	8.4897** (1.9956)	5.4402** (2.4008)
Parents' Income ($ thousands)	0.0021 (0.0022)	0.0047* (0.0026)	0.0056 (0.0035)	0.2201** (0.0876)	0.1762* (0.1021)	0.0304 (0.1238)
Married	-0.0731** (0.0197)	-0.0842** (0.0209)	-0.1380** (0.0292)	-10.7469** (0.7272)	-13.3442** (0.8431)	-14.6107** (1.0829)
Dependents	0.0170 (0.0228)	0.0244* (0.0136)	0.0377** (0.0141)	0.0723 (0.8773)	-0.6686 (0.5247)	2.2965** (0.5024)

(continued)

APPENDIX TABLE A.1, continued

	Log Weekly Earnings			*Annual Weeks Worked*		
	1973	*1976*	*1979*	*1973*	*1976*	*1979*
Area Wage Rate	0.0209 (0.0195)	0.0234 (0.0160)	0.0142 (0.0218)	-1.0274 (0.7531)	-2.1454** (0.6211)	-2.0798** (0.7716)
Area Unemployment Rate	-0.0115* (0.0060)	0.0063 (0.0072)	0.0278* (0.0148)	-0.4399* (0.2339)	-0.0876 (0.2812)	0.6448 (0.5263)
Rural	-0.1144** (0.0309)	-0.0640* (0.0328)	-0.1418** (0.0431)	-2.5134** (1.2075)	-3.4600** (1.2681)	-2.5680* (1.4960)
Town	-0.0937** (0.0285)	-0.0608* (0.0315)	0.0710* (0.0426)	-2.9634** (1.1207)	-1.4082 (1.2343)	-0.5086 (1.5060)
Urban	-0.0154 (0.0274)	0.0130 (0.0301)	-0.0081 (0.0412)	-1.3973 (1.0841)	-1.1391 (1.1891)	-1.0762 (1.4745)
South	0.0142 (0.0316)	0.0233 (0.0335)	0.0060 (0.0486)	-0.4577 (1.2217)	-0.9671 (1.3020)	-0.2012 (1.7003)
East	0.0961** (0.0291)	0.0457 (0.0383)	-0.0603 (0.0537)	0.6371 (1.1585)	-1.0368 (1.4743)	-3.5785* (1.8729)
West	0.0083 (0.0340)	0.0922** (0.0396)	0.0370 (0.0521)	-2.5833** (1.2944)	-3.3523** (1.4881)	-4.3799** (1.8336)
Intercept	4.0889** (0.1399)	3.9453** (0.1529)	3.8649** (0.2128)	32.3922** (5.3761)	33.1100** (6.0198)	37.8432** (7.5620)
R^2	0.0694	0.0743	0.0687	0.1877	0.1402	0.1347
Sample Size	1,757	1,765	1,412	2,431	2,624	1,854

NOTE: The regressions for 1973 and 1976 include individuals with twelve years of schooling as of 1976. A number of individuals who attended school for the first time after 1976 were also excluded from the 1979 regressions. Standard errors are in parentheses.

* indicates significance at the .10 level
** indicates significance at the .05 level

APPENDIX TABLE A.2

Estimates of Models of Weekly Earnings and Annual Weeks Worked

Men

	Log Weekly Earnings			*Annual Weeks Worked*		
	1973	*1976*	*1979*	*1973*	*1976*	*1979*
Commercial	-0.0150 (0.0847)	-0.0440 (0.0805)	0.0836 (0.0998)	1.0811 (3.0336)	1.3428 (2.5302)	1.8346 (2.6062)
Trade and Industrial Arts	0.1458** (0.0592)	0.0398 (0.0552)	0.0680 (0.0694)	3.3753 (2.1051)	0.7075 (1.7437)	-0.3777 (1.8015)
Other Technical	0.2044 (0.1260)	-0.1574 (0.1133)	-0.0468 (0.1320)	6.3600 (4.4751)	2.5160 (3.4965)	-0.9068 (3.4388)
High School Work Experience						
0-10 hours	0.0566* (0.0304)	0.0059 (0.0278)	0.0854** (0.0340)	3.2819** (1.0549)	3.1981** (0.8871)	-1.4239 (0.8960)
10-20 hours	0.0442 (0.0290)	0.0416 (0.0275)	0.0529 (0.0330)	6.5492** (0.9994)	2.6424** (0.8602)	0.0326 (0.8658)
20+ hours	0.0970** (0.0256)	0.0833** (0.2370)	0.0984** (0.0290)	7.8198** (0.8826)	3.8566** (0.7526)	-0.2687 (0.7600)
Black	-0.0776** (0.0285)	-0.1072** (0.0264)	-0.1036** (0.0324)	-3.4165** (0.9959)	-2.3362** (0.8365)	-1.4761* (0.8521)
Hispanic	-0.0859** (0.0437)	-0.0484 (0.0393)	-0.0964* (0.0501)	-2.7270* (1.4933)	0.2362 (1.2450)	-0.8072 (1.3215)
Test	0.0286 (0.0302)	0.0236 (0.0268)	0.0757** (0.0330)	2.3425** (1.0481)	0.9563 (0.8449)	1.3994 (0.8600)
Class Rank	-0.0020 (0.0486)	0.0369 (0.0430)	0.0689 (0.0537)	-0.0592 (1.6854)	2.2025 (1.3641)	1.4053 (1.4028)
Parents' Income ($ thousands)	0.0072** (0.0021)	0.0117** (0.0020)	0.0180** (0.0024)	0.0979 (0.0743)	-0.0513 (0.0611)	0.0716 (0.0611)
Married	0.0916** (0.0329)	0.1080** (0.0222)	0.0274 (0.0264)	4.3030** (1.1623)	3.7580** (0.7010)	2.0919** (0.6939)
Dependents	0.0404** (0.0201)	0.0066 (0.0104)	0.0458** (0.0098)	-0.0766 (0.7046)	-0.3062 (0.3308)	0.5101** (0.2566)

(continued)

APPENDIX TABLE A.2, continued

	Log Weekly Earnings			*Annual Weeks Worked*		
	1973	*1976*	*1979*	*1973*	*1976*	*1979*
Area Wage Rate	0.0758** (0.0198)	0.0828** (0.0133)	0.0610** (0.0166)	0.0550 (0.6876)	-0.3994 (0.4216)	-0.4366 (0.4355)
Area Unemployment Rate	-0.0069 0.5059)	-0.0028 (-0.0058)	-0.0047 (0.0117)	-0.4055* (0.2071)	-0.4946** (0.1837)	0.0510 (0.3042)
Rural	0.0119 (0.0321)	0.0222 (0.0254)	-0.0455 (0.0322)	1.9137* (1.1185)	-1.6298** (0.8008)	-0.9046 (0.8441)
Town	0.0229 (0.0310)	0.0310 (0.0245)	0.0118 (0.0328)	0.4712 (1.0744)	-1.0707 (0.7775)	-1.3785 (0.8580)
Urban	0.0135 (0.0301)	0.0569** (0.0246)	0.0167 (0.0327)	-0.0443 (1.0451)	-0.9512 (0.7775)	-2.1650** (0.8556)
South	-0.0300 (0.0318)	0.0111 (0.0275)	-0.0020 (0.0366)	0.3974 (1.1097)	1.5321* (0.8736)	0.4084 (0.9557)
East	-0.0054 (0.0308)	-0.0002 (0.0315)	-0.0218 (0.0415)	0.5525 (1.0752)	1.7319* (0.9954)	-0.8451 (1.0836)
West	-0.0467 (0.0318)	0.0304 (0.0296)	0.0415 (0.0371)	-1.4695 (1.0994)	0.7024 (0.9364)	-1.3537 (0.9703)
Intercept	4.2141** (0.1325)	4.1639** (0.1165)	4.0542** (0.1527)	28.7783** (4.6503)	43.5480** (3.6620)	45.2138** (3.9559)
R^2	0.0890	0.1183	0.1626	0.0997	0.0547	0.0497
Sample Size	1,825	2,084	1,372	2,022	2,249	1,461

NOTE: The regressions for 1973 and 1976 include individuals with twelve years of schooling as of 1976. A number of individuals who attended school for the first time after 1976 were also excluded from the 1979 regressions. Standard errors are in parentheses.

APPENDIX TABLE A.3

Estimates of Alternative Models of Weekly Earnings and Annual Weeks Worked

	Log Weekly Earnings			*Annual Weeks Worked*		
	1973	*1976*	*1979*	*1973*	*1976*	*1979*
I. Women						
All Occupational Courses	0.1873**	0.2876**	0.1407*	7.4225**	10.3750**	2.3379
	(0.0512)	(0.0592)	(0.0797)	(2.0322)	(2.2972)	(2.8122)
Academic Program	-0.0256	-0.0497	0.0001	0.8965	0.5423	0.7568
	(0.0284)	(0.0329)	(0.0440)	(1.1219)	(1.2701)	(1.5599)
Vocational Program	0.0428**	0.0578**	0.0568*	3.6822**	2.3451**	0.6566
	(0.0202)	(0.0225)	(0.0298)	(0.7836)	(0.8767)	(1.0500)
Academic Program	-0.0198	-0.0455	0.0062	1.0498	0.6414	0.8616
	(0.0283)	(0.0327)	(0.0438)	(1.1164)	(1.2661)	(1.5563)
Commercial Program	0.0690**	0.0882**	0.0882**	4.9623**	3.2680**	0.9850
	(0.0212)	(0.0241)	(0.0325)	(0.8469)	(0.9488)	(1.1405)
Technical Program	-0.0474	-0.0096	0.0458	0.0681	0.4032	1.5271
	(0.0378)	(0.0420)	(0.0567)	(1.4076)	(1.6452)	(2.0125)
Home Economics Program	0.0184	-0.1438**	-0.1303*	-2.8217	-3.3375	-2.3033
	(0.0607)	(0.0583)	(0.0675)	(1.9803)	(2.0512)	(2.4348)
II. Men						
All Vocational Courses	0.1124**	0.0052	0.0692	3.2167*	1.0766	0.6340
	(0.0534)	(0.0502)	(0.0624)	(1.9029)	(1.5797)	(1.6242)
Academic Program	-0.0160	0.0037	-0.0168	1.0295	-0.4038	0.7055
	(0.0264)	(0.0248)	(0.0312)	(0.9163)	(0.7815)	(0.8087)
Vocational Program	0.0190	0.0325*	0.0169	1.9715**	-0.4024	1.4663**
	(0.0204)	(0.0187)	(0.0232)	(0.7177)	(0.5887)	(0.5985)
Academic Program	-0.0175	0.0060	-0.0169	1.0858	-0.4415	0.7541
	(0.0264)	(0.0248)	(0.0312)	(0.9150)	(0.7809)	(0.8072)
Commercial Program	-0.0017	0.0422	-0.0054	2.1770	-0.8549	0.2740
	(0.0452)	(0.0421)	(0.0543)	(1.6104)	(1.3141)	(1.4014)
Technical Program	0.0182	0.0390**	0.0203	2.1699**	-0.4448	1.8569**
	(0.0213)	(0.0196)	(0.0242)	(0.7533)	(0.6155)	(0.6242)

NOTE: See table 14-4.

* indicates significance at the .10 level
** indicates significance at the .05 level

APPENDIX TABLE A.4

Simple Statistics

Variable	*Women*		*Men*	
	Mean	*Standard Deviation*	*Mean*	*Standard Deviation*
Commercial	0.2864	0.1876	0.0884	0.1108
Technical	0.0324	0.0728	—	—
Home Economics	0.0680	0.0744	—	—
Trade & Industrial Arts	—	—	0.1875	0.1696
Other Technical	—	—	0.0410	0.0773
Vocational Courses	0.3855	0.1784	0.3236	0.1729
Academic Program	0.1403	*	0.1444	*
Commercial Program	0.3309	*	0.0383	*
Technical Program	0.0737	*	0.2799	*
Home Economics Program	0.0337	*	—	*
High School Work Experience		*		
0-10 hours	0.1947	*	0.1682	*
10-20 hours	0.2276	*	0.2052	*
20+ hours	0.2374	*	0.4313	*
Black	0.1358	*	0.1558	*
Hispanic	0.0502		0.0509	
Test	2.8480	0.4092	2.7399	0.4091
Class Rank	0.4790	0.2609	0.3327	0.2312
Parents' Income ($ thousands)	9.0492	4.8600	9.7222	5.0228
Married, 1973	0.4253	*	0.1963	*
Married, 1979	0.7174	*	0.6099	*
Dependents, 1973	0.1229	0.4089	0.3229	0.6531
Dependents, 1979	0.5912	0.9774	1.4257	1.3250
Area Wage Rate, 1973	4.14	0.63	4.13	0.67
Area Wage Rate, 1979	6.65	0.96	6.65	0.96
Area Unemployment Rate, 1973	3.2041	1.7312	3.2864	1.7791
Area Unemployment Rate, 1979	5.8213	1.1651	5.7337	1.1251
Rural	0.2069	*	0.2488	*
Town	0.2916	*	0.2878	*
Urban	0.3497	*	0.3368	*
South	0.3677	*	0.3848	*
East	0.2217	*	0.1845	*
West	0.1382	*	0.1884	*
Sample Size	2,431	—	2,022	—

* indicates a zero-one dummy variable.

APPENDIX B

Methodology for Constructing Income Profiles for Individuals with Different Levels of Vocational Education

Let us define a set of equations for log wages, log hours, and annual weeks worked:

$$(1)\quad \log W = XB_1 + c_1V + e_1$$

$$(2)\quad \log H = XB_2 + c_2V + e_2$$

$$(3)\quad E = XB_3 + c_3V + e_3$$

Furthermore, let $\overline{W}$, $\overline{H}$, and $\overline{E}$ indicate the average labor market outcomes for individuals in the sample, and W′, H′, and E′ indicate the labor market outcomes associated with an increase in vocational education of h, holding all other variables constant. The relationships between these two sets of outcomes are given below:

$$(4)\quad W' = e^{c_1h} \cdot \overline{W}$$

$$(5)\quad H' = e^{c_2h} \cdot \overline{H}$$

$$(6)\quad E' = \left(1 + \frac{c_3h}{\overline{E}}\right) \cdot \overline{E}$$

Total income corresponding to the higher level of vocational education is:

$$(7)\quad Y' = W'H'E' = e^{c_1h}e^{c_2h}\left(1 + \frac{c_3h}{\overline{E}}\right)\overline{W}\overline{H}\overline{E}$$

The difference in incomes is given by:

$$(8)\quad Y' - \overline{Y} = \left\{ e^{c_1h}e^{c_2h}\left(1 + \frac{c_3h}{\overline{E}}\right) - 1 \right\}\overline{Y}$$

The figure in brackets represents the increase in income that can be attributed to vocational education. It consists of the product of changes in wages, hours, and employment. Define g_1, g_2, and g_3 as the proportional increase in wages, hours, and employment, respectively, due to vocational education. The total change in income can be decomposed into the sum of first order changes in wages, hours, and employment, and interaction effects.

(9) $$Y' - \overline{Y} = \left\{(1+g_1)(1+g_2)(1+g_3) - 1\right\}\overline{Y}$$
$$= \left\{g_1 + g_2 + g_3 + \text{interactions}\right\}\overline{Y}$$

where $$g_1 = e^{c_1 h} - 1$$

(10) $$g_2 = e^{c_2 h} - 1$$

$$g_3 = \frac{c_3 h}{\overline{\overline{E}}}$$

Separate estimates of income differentials ($Y'_t - \overline{Y}$) are calculated for each year. The present discounted value of the income differentials that can be attributed to an increase in vocational education of h is given by

(11) $$PV' - \overline{PV} = \sum_{t=o}^{T} \frac{Y'_t - \overline{Y}_t}{(1+r)^t}$$

where r is the real rate of discount. In our study a value of 3 percent was used. Similarly, the present discounted value of average income is given by

(12) $$\overline{PV} = \sum_{t=o}^{T} \frac{\overline{Y}_t}{(1+r)^t}$$

A standardized estimate of the present value of income differentials is given by $(PV' - \overline{PV})/\overline{PV}$.

ALAN L. GUSTMAN

15

The Vocational Education System—Reactor Comments

To provide a framework for viewing the papers presented here, I would like to discuss briefly some outstanding questions concerning the economic impacts of vocational programs. I will then ask what these papers contribute to filling the gaps in our knowledge.

There has been a considerable amount of research and evaluation work concerned with the impact of vocational education on market outcomes and later schooling. Yet at a time when tight budget constraints create severe competition among programs for scarce federal dollars, we are in a position to provide only sketchy information about the relative contribution of vocational training to any objective measure of program impact, and even less information on how to alter the design of these programs to enhance their economic impact.

Two broad questions need to be answered: First, do vocational training programs improve economic outcomes? Second, if they do, how do they work? By this second question, I mean: Do they provide skills that are directly usable by firms? Do they provide labor market information that truncates the youth's initial labor market search process and related unemployment? Do they improve the efficiency of on-the-job training?

One reason these questions have not been answered satisfactorily is that the data and the analytical tools required to answer them have only recently become available. Consider the following problems. First, we know that we cannot determine whether vocational programs are truly effective by simply comparing direct outcome measures (e.g., wages) for vocational and nonvocational program graduates. Individuals are not assigned to high school or posthigh school programs on a random basis. Those who choose a vocational course of study may be "different" from those who choose an academic or a general course, for example, different in their motivation. It may not be enough to standardize for observable factors, such as parental income, education, and family acquisitions. Moreover, there are problems created by the possibility of selectivity bias—i.e., by the fact that the observed wage for persons who have chosen a vocational program in high school may not provide a good indication of what persons who have chosen another high school program would earn had they chosen a vocational program instead. Analogous reasoning applies for estimating the opportunity wage, had another program been chosen, for a person who chose a vocational program in high school.

Techniques are available for estimating the impacts of unmeasured attributes, and for correcting for selectivity bias, but these techniques have not as yet been applied when analyzing the impact of vocational training.

One possible approach to dealing with selectivity bias is to develop more information than we have at present on how vocational enrollments are determined both on the individual and in the school district level, and on how to use information on the selection process to control for differences in opportunities for vocational and nonvocational students in the areas they do not select. To understand the enrollment process, in turn, we must have answers to questions such as: Are enough places in vocational programs created for all who apply? Are students assigned or coerced into the program if the number of places available does not match the number of applicants? How is program quality adjusted in view of enrollments? Is a relatively fixed pie of funds divided among a greater number of participants the higher the enrollments, or does overall funding increase in proportion to student supply? Useful background information in this regard is presented by Rupert Evans, and specific data are discussed by Robert H. Meyer and by David Wiley and Annegret Hornischfeger.

The best we have done to date is to use a stopgap to the unmeasured quality question. If one takes the view that vocational and general program graduates are more like one another than they are like academic program graduates, then it would be more appropriate to compare outcomes between vocational and general program graduates with equal amounts of schooling, than to compare earnings of vocational graduates with those of individuals with comparable amounts of total schooling who completed an academic program. Past work has, indeed, focused on a comparison of outcomes between vocational and general program graduates.

Note also that in the case of women, when evaluating the impact of a school program, the selection process and standardization for selection becomes even more complicated. Not only is there selection when choosing a school program, but, in addition, there is the labor market participation decision to be taken into account.

Tom Steinmeier and I have pointed out elsewhere another reason why one cannot determine the size of the impact of vocational programs by simply comparing outcomes between vocational and nonvocational graduates with the same number of years of schooling. In a well-operating market, students would gravitate to the program offering highest returns, bidding those returns down until comparable individuals enrolling in different programs had identical outcomes. This means, for example, that if there were (1) no unmeasured differences between those enrolling in different high school programs, (2) no differential "option value" of higher education to graduates of vocational and general programs in high school, and (3) an adequate number of places created for all who applied, then the outcomes over the lifetime for graduates of two different high school programs who ended their education after high school would be identical. Accordingly, the observed outcome differences between those in different programs may provide no indication of how the introduction of a vocational program into an educational system that does not have one will affect productivity, or how the current system has raised productivity compared to a situation in which there were no vocational training programs at the secondary or postsecondary level.

Rob Meyer assumes that academic course work reduces the cost of on-the-job training, and notes that as a result, even if entry into all programs is free so that present values are equated for identical individuals across high school programs, the profiles may be flatter for those electing vocational rather than other programs. Thus, the existence of differentials in yearly earnings in the early years may not imply that there are corresponding differentials in lifetime earnings.

Consider now the empirical analyses conducted by Rob Meyer and by Tom Daymont and Russ Rumberger. Both papers investigate the relation between returns and the number of vocational courses taken by narrow specialization. In addition, Daymont and Rumberger consider the importance of whether vocational training is used in the occupation actually secured, and Rob Meyer investigates how the returns to vocational training vary with years since graduation. I will take up each of these findings in turn.

There is not enough information reported in most of the tables in the Daymont and Rumberger paper to draw exact conclusions as to whether each of the measures of vocational and nonvocational course work investigated have identical impacts on outcomes. Their sample consists of youths with ten to twelve years of schooling. Thus, in a regression where some economic outcome is related to number of academic courses taken and number of courses taken in, for example, a business and office program, the coefficients on the schooling variables reflect two effects—(1) the impact of more schooling and (2) the impact of the field in which the schooling was taken. What we would like to know is whether the coefficient on the variables measuring number of vocational courses of a particular type is significantly different from the coefficient on a variable measuring number of academic courses. In some cases the answers can be determined by inspection or from some information reported in their table 13-6. In others, such as where narrow field of study is examined, the appropriate tests for differences in coefficients are not made.

By and large, Daymont and Rumberger appear to find similar effects (i.e., no significant difference between the effects of total number of vocational courses taken and the number of academic courses taken) on the dependent variables considered—hourly earnings, weeks unemployed, and hours per year worked. One exception is that vocational training significantly increases hours worked for men, whereas academic training does not. The authors adopt a number of categories for training—distinguishing between those who were or were not in a vocational program and those who did and did not apply their training in their job. The three-way comparisons required—e.g., between the coefficients on variables measuring academic credits, vocational credits for those in a program, and vocational credits for those not in a program—do not paint a clear picture of the *relative* effects of enrolling in a vocational program or securing a job in the field of training, by sex, for each dependent variable considered.

Consistent with other findings, when narrow types of vocational training are distinguished, the one type of training that has an across-the-board effect on wages and employment is business training for women—here, when the person is employed in an occupation which uses that training—(their table 13-8). But again, there is no indication of which other courses exhibit returns that differ significantly from those associated with business and office training for this group.

Rob Meyer's results on the impact of the number of widely and narrowly defined vocational courses taken on economic outcomes are easier to interpret because his sample is confined to individuals with a consistent level of education—twelve years. As Rob Meyer notes, strictly speaking, with years of schooling held constant, an increase in number of vocational courses taken implies that fewer nonvocational courses are taken, so the coefficient estimates reflect the net effect of taking more vocational course work and less nonvocational course work. Rob Meyer's paper reinforces the impression gained from such studies as Grasso and Shea, as well as from some work I have done with Tom Steinmeier and others, that business programs in high school for women are associated with higher earnings than are general programs. (A word of warning—many of these findings are based on the same data set or sets, so that each study does not contain new and independent evidence.)

In the case of men, the evidence here and elsewhere is more sketchy and less supportive of a positive return. Steinmeier and I found some evidence of positive returns to courses in trade and industry over a general high school program, but only in the case where the dependent variable is weekly earnings. Rob Meyer, using the same data set but a different specification, finds a similar tendency.

Somewhat strangley, despite the fact that both Meyer's and Daymont and Rumberger's papers stress the importance of using number of credits taken as an indicator of vocational training, rather than basing findings on a comparison of returns between vocational and general or academic program graduates, neither paper really follows through by presenting a careful analysis of what difference it makes to estimated returns to vocational education if field of study is represented by dummy variables, which might measure the average effect of these programs, each of which usually contains some vocational training, rather than if estimated returns to vocational training are based on the number of vocational courses taken. To be sure, both sets of authors present one table in which it is possible to discern some differential effects between these approaches. But despite the early emphasis in both papers on the importance of measuring vocational training of different types by number of courses rather than by dummy variables, and despite the fact that previous studies based on different data sets have used the dummy variable specification and therefore may, in the author's views, be providing misleading policy information, the question of what difference this change in specification makes is not systematically considered.

One reason it may be important to measure vocational training by number of courses taken is that the returns to vocational training may not vary linearly with the number of courses taken. Rob Meyer is investigating that issue now. But even if earnings vary nonlinearly with the amount of vocational training, I would like to suggest that it may be a mistake to ignore the information conveyed by declared major field of concentration. More specifically, I would recommend using a specification in which academic, general, or vocational programs of one type or another are indicated by dummy variables, whereas in the same regression separate variables are used to indicate the number of vocational courses of different types taken, and appropriate interactions are explored. This would prove to be a useful procedure either if those enrolling in different high school programs differ in unmeasured ability and motivation, or if there are differences in the content of academic courses taken by those in different programs, e.g., English or math, especially between those in general or vocational programs on the one hand and academic programs on the other.

The other unique contribution from these papers is Rob Meyer's analysis of the age-earnings profile. His analysis is an important first step toward answering the question of how vocational education affects earnings. Even if places in vocational programs are available to all who apply, so that the present values of rewards accruing to similar individuals who choose vocational and other courses are equalized through adjustments on the supply side, if the profile of someone who is completing a vocational course is flatter than that for a person who is completing an academic course, one would find that the earnings of a vocational program graduate are higher in early years but lower in later years. If data sets such as the Survey of the Class of 1972, which have not followed the individuals for many years after they have completed high school, were used, then there may be a tendency to overestimate the returns to vocational training because years with positive differences are oversampled. Although I find the evidence Rob Meyer presents on the decline in the differential with years to graduation to be interesting, a number of questions remain to be answered. First, there is a question of how vocational training affects the age-earnings profile. Does other evidence also indicate that the profile becomes flatter the more vocational courses one takes? Do high school graduates who concentrate on nonvocational courses actually earn more after some period of time than do comparable graduates who concentrate on vocational courses—i.e., do those with mostly nonvocational courses: (1) catch up to those with vocational courses and (2) eventually earn *more*. Consider the finding that returns to vocational training decline with years since high school graduation. Does it hold up consistently for other cohorts beside the class of 1972? Results based on the original Parnes survey reported in table 3 of my paper with Tom Steinmeier on economic outcomes imply that for the ten cohorts of women covered in the survey (the group for which the evidence of an impact of vocational training is most consistent), only half exhibited returns to business and office training that declined with years since graduation (Gustman and Steinmeier 1981). To be sure, the cell sizes are small, the amount of vocational training is measured by program participation rather than number of courses taken, and another analysis with a greater number of observations may contradict this result. Nevertheless, we should remember that Rob Meyer's finding of declining returns to vocational training with years since graduation has only been demonstrated for a single cohort, and, as he is well aware, sufficient time has not passed to observe the many years of negative increments for vocational graduates that might be encountered. Let me note parenthetically that there is some additional support for the view that the age-earnings profile is flatter for vocational program graduates. This evidence is in the sample of men analyzed by Grasso and Shea (1979).

What I would like to see is more direct evidence to support the model presented in Rob Meyer's paper, a model that is based on two *independent* assumptions: First, that vocational education works by providing what Rob Meyer calls "Distinct Job Skills" in early years to graduates of vocational programs, and second, that academic program graduates with the same number of years of education receive what he calls "General Learning Skills," which encourage more on-the-job training, thus accounting for their steeper earnings profile. I would also like to see evidence that either supports or contradicts alternative explanations of the role of vocational training. After all, vocational training may work in other ways—for example, by shortening the young person's job search process. If it does truncate the search process, higher earnings in early years for vocational program graduates need not be accompanied by lower relative earnings in later years. Of course, for this to be the case, the market would have to be in disequilibrium, perhaps because there is a limit on the number of places in vocational programs, or as a result of rapid and continuing shifts in demand to which supply has not yet adjusted. Fortunatley, we have a theoretical framework from Leighton and Mincer (forthcoming) for analyzing how this job search process might work, and direct data on job tenure, general market experience, and on-the-job training, which can be used to sort out the relations between high school program, job search, and on-the-job training. Testing the further implications of the two assumptions Rob Meyer makes, as well as analyzing alternative models such as those based on the relation between job search and occupational choice, are the next logical steps to following up on Rob Meyer's work.

An additional question I would like to see answered relates to the intermediating role of tenure, experience, unionization, and other intervening variables that may be affected by vocational training and, in turn, affect economic outcomes. If we are to understand how vocational training affects economic outcomes, we must understand whether it works through a set of intervening variables, or improves outcomes directly, that is, even if these intervening variables are held constant. When Steinmeier and I investigated this issue with two different data sets, we obtained contradictory answers. It would be of interest to see whether, using the specifications developed here, vocational training seems to operate directly on economic outcomes, or improves them by raising tenure, experience, the prospects of obtaining a union job, and (related to the findings of Daymont and Rumberger) whether these effects depend on the relation between high school training and occupation.

To this point the discussion has focused on returns to vocational training in high school among those who complete no more than twelve years of schooling. Consideration should also be given to the direct effects of vocational training at the postsecondary level on economic outcomes, to the differential returns to high school program for those who have attained more than a high school education, and to the effects of high school program on years of schooling attained. This last subject is also analyzed by Rob Meyer. He emphasizes, I think quite appropriately, the difficulties that are raised because the decisions as to which high school program to take and as to the educational program chosen at the postsecondary level, if any, are clearly, jointly related. This means not only that it would be inappropriate to attempt to determine the impact of high school program on later education by regressing years of schooling on high school course of study, as some students of this subject have done, but also that unless a carefully constructed indicator of later educational plans is included in the analysis, one is likely to overstate the impact of particular high school program on returns to later schooling. Note that, after making an effort to control for high school plans, Rob Meyer concludes that vocational education has an important effect on postsecondary educational activity.

Let me suggest an approach that one may take in further analyzing the relation between high school program and later schooling. It may be fruitful to adopt a model analogous to the one used for analyzing decisions to quit jobs—viewing time spent in a particular course of study, with the aim of achieving a particular educational goal, as creating capital that is useful in only a limited number of activities. Over time, as new information on one's own ability or opportunities in other fields accumulates (i.e., as broad uncertainties are narrowed, and some early guesses prove inaccurate), and as other circumstances change, some capital may be sacrificed—with the individual changing educational plans if the gains from such a change are worthwhile.

Let me turn now to Rupert Evans' paper. Much of Dr. Evans' paper provides a rich and detailed description of the vocational education system. This description provides a sharp reminder to the empirical researcher of the basic assumption that not standardizing for differences in organization, delivery system, type and quality of equipment, and other factors may result in systematic biases. This type of reminder is extremely useful to an empirical researcher.

There are, in addition to the descriptive material, statements in Evans' paper on program impact that are in direct contradiction to the findings in the other papers delivered here, or which as a result of this research may require qualification. For example, at one point, Evans notes that: "Longitudinal studies ... have demolished the notion that occupational education pays off better in the short than long run. Pay differentials in favor of vocational education increase, rather than decrease, with time." Yet Rob Meyer's results lead him to conclude that: "Evidence on the declining effectiveness of commercial course work suggests that income differentials may eventually become negative." Rob Meyer also concludes that: "Modest effects of trade and industrial arts courses were also found for men. Here again, income gains were significant in the years immediately after graduation from high school. By 1979, however, the effect of vocational education was zero or negative." As I noted earlier, further evidence is required to determine which view is correct.

At another point, Evans states that: "Virtually every recent study of such programs shows the following personal benefits from secondary school vocational education: decreased school dropout rates, increased annual earnings (short and long term) and decreased rates and length of unemployment." Although Daymont and Rumberger find positive effects from taking more vocational courses (as opposed to *no* additional courses), in their judgment: "The general conclusion of our study is that high school training—both academic and vocational—does affect labor market opportunities for high school students who do not attend college. We are unable to say, however, that one type of training is generally superior to the other." If Evans meant by his statement that vocational and nonvocational courses at the secondary level have similar positive impacts, then his statement is consistent with the conclusions of Daymont and Rumberger. If not, it must be reconciled not only with Daymont and Rumberger, but also, due to the strength of the statement, with the findings of Rob Meyer and others—of positive returns *relative* to other course work for women in business programs, and of zero or possibly positive returns to trade and industry courses for men.

I recognize that it is common for a researcher, when considering any topic, and especially when considering a topic related to training programs, to close by noting that there are unanswered questions and that a considerable amount of work remains to be done. Nevertheless, I think that in considering evaluations of vocational education, such a closing is particularly appropriate. Moreover, such a closing does not carry the same kind of discouraging implication as it might after discussing other topics. Much can be learned from the data sets that are already available. Appropriate analytic tools have been developed, but have not yet been applied for analyzing returns to vocational training. In that sense, additional knowledge about the impact of vocational training and how it works may be gained at a lower cost than is required to obtain comparable information about other labor market programs.

The goals of this Forum stress a need for policy implications to flow from the Forum. But in view of the current state of research on the impacts of vocational education, except for noting the existence in early years of the strong positive returns, especially to business and office training for women, I do not believe that, based on these studies of economic impacts, we are as yet in a position to make strong policy recommendations, especially concerning changes in the design of the vocational education system. We simply do not have adequate information on *how* vocational and nonvocational training affect economic outcomes—through direct effects of training, through impacts on the costs of returns to on-the-job training, or through effects on information flow and search costs—to justify such recommendations.

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Job Training in Business and Industry

STANLEY J. HOLDEN

16

Business, Industry and Labor: Linkages Between Training and Employment

INTRODUCTION

This paper represents a practitioner's point of view of technical and skills training in business, labor, and industry. It is based upon experience in both the public and private sectors, with both small and large organizations, covering a wide range of occupations. It focuses on the problems associated with training people to fix sophisticated solid-state electronic equipment; repair complex mechanical devices; and to operate word processors, nuclear power plant control rooms, and machine tools. These activities and others like them have provided the broad experience of the realities of providing technical and skills training in the work environment from which this paper is drawn. Thus, the views expressed here are based largely on personal experience, discussions with managers and workers in many industries and institutions, and on personal observations in a variety of work settings. This paper is not heavily steeped in statistics that are supported by many pages of bibliography. Much of what is said and many of the views deal with issues for which no statistics are readily available. They are, however, based upon wide experience and on the prevailing opinions of the people in the world of work whom we have encountered over the years. There may be some who will read this paper and take issue with some of the views expressed. That is to be welcomed since the main objective of this treatise is to stimulate thought about ways to address real problems that currently exist concerning technical and skills training in the work environment.

THE NATURE OF TECHNICAL AND SKILLS TRAINING

Technical and skills training has several unique features that make it somewhat different from other types of training. Whereas all training requires the transfer of knowledge, there are many types of training in which the acquisition of knowledge is sufficient. A good example of this would be some type of employee-orientation training about the history of a particular company or about the organizational structure of a company or division. Technical and skills training, however, by its very nature requires the demonstration of skill. Some of those skills even involve techniques that are virtually impossible to transfer in any way except through practice. A good example of such activities would be trying to train someone how to weld or to grind parts. But even in cases where the tasks that must be taught are more discrete (for example, throwing a number of switches in the proper order), there must be some demonstrable procedure to ensure that the skills or tasks have been mastered. Thus, it would seem that technical and skills training has two requirements in addition to the knowledge requirements that must be met. First, good technical and skills training design requires hands-on activities for practice; and second, the only really valid overall test of successful technical and skills training is a performance test. Although it is possible to test the efficiency of the knowledge portion of a technical and skills training program using standard pretest and posttest techniques that are criterion referenced, such testing gives little indication of a person's ability to perform the actual tasks on the actual equipment in the work place. These pretesting and posttesting techniques measure only the efficiency of what has been taught in the training program. They in no way deal with the effectiveness of the training program by giving an indication of how well the trainee can actually perform the physical tasks in the work environment. Anyone attempting to offer effective technical and skills training comes face-to-face with this reality soon after implementing the first training program. Based upon this view, the remainder of this paper is based on the assumption that we are discussing the issues and problems of providing technical training that involves hands-on activities and whose measure is how well the trainees perform when given a performance test.

REASONS THAT COMPANIES TRAIN

The reason why some companies have training programs and others do not is not easily discerned. The Bureau of Labor Statistics in a 1976 bulletin entitled "Occupational Training in Selected Metalworking Industries, 1974" (U.S. Department of Labor 1976) concluded the following as a result of their survey: "Establishments provided training primarily because they felt job skills could best be taught in their own training programs and because the education and/or training background of their employees was inadequate."

A somewhat broader view that is based on experience leads one to conclude that there are four major reasons why organizations choose to train. One reason is that their industry requires and/or expects it. A good example is the computer industry, where it has long been a practice to provide training for both customers and employees to create effective utilization of the hardware and software. The complexity of the hardware and software made training a necessity in the industry and it has, therefore, become an industry standard. All major computer companies provide this type of training and training budgets in computer companies are found to be on a per capita basis among the highest in the country. Training is also heavily done and expected in certain semipublic industries such as the utility industry and the telephone industry. A second reason for doing training is that management insists upon it. In a company where upper-level management is committed to training, it will usually get done since they will provide for it. Often the training is insisted on because of some unique feature of the company's business that makes incoming workers unfamiliar with the processes.

In a number of industries, the labor agreement requires the company to train employees. Especially in the larger industries, for example, the automotive industry and the steel industry, labor agreements call for management to provide certain types of training. In such cases, the companies will provide training whether they wish to or not since it is a requirement.

By far the largest reason for doing training that we have encountered has been that a company is suffering financially due to the lack of training. This is a situation that is often prevalent in manufacturing industries, especially if the manufacturing is of a technical nature. In such industries, the entire organization is driven by production figures and costs. Managers are constantly monitoring production numbers, scrap figures, and machine downtime. If they are not, they certainly begin to do so once a company starts to experience financial difficulty or is not obtaining the profit margins it requires. They implement training in an effort to improve productivity and reduce scrap and downtime. Unfortunately, these last-minute training efforts are often too little too late. Yet few companies seem inclined to undertake large training efforts unless forced to do so by some requirement placed upon them either by the nature of the industry they are in or by their labor agreement.

Companies do not train willingly because almost universally they view training as a cost, and a cost for which the return on investment or cost-benefit is not easily discernible to them. It is instructive to discuss at this point why it is that companies do not train.

MOST COMPANIES DO NOT TRAIN

Statistics in these areas of training are indeed scanty. The American Society for Training and Development (ASTD 1979a) estimates that private and public employers in the United States in 1978 spent between $30 and $40 billion on employee development, not including the salaries and wages of the trainees (ASTD 1979a). They also found that most adult learning is job related, exceeding 55 percent (ASTD 1979b). *Hope Reports Perspective* (1978) estimated that in 1976 about $20 billion was spent by public and private employers to train workers. In 1977 the U.S. Department of Labor reported that unions had spent $185 million in federal training funds since 1963 (U.S. Department of Labor 1977). In July 1976 the U.S. Department of Labor's Bureau of Labor Statistics report mentioned previously indicated that training cost data are largely unavailable (U.S. Department of Labor 1976). *Education in Industry*, a report by Seymour Lusterman (1977), indicates that an entire "shadow" education system exists in industry. The report indicates that most companies plan and conduct their programs with personnel who have other primary duties, often using outside consultants.

Most companies do not install formal training programs, and there are a variety of reasons for this. In the U.S. Department of Labor report that was previously cited (1976) it was found that "only 15% of all establishments in the four metalworking industries that were selected provided structured occupational training in the fourteen occupations studied in 1974." That situation has not changed much from 1974 until the present.

By far the largest reason companies are reluctant to establish sizable formal training programs is that training is viewed as a cost and not an investment. Dr. Thomas F. Gilbert, in the March/April issue of *Personnel*, discussed the cost of training in an article entitled "The High Cost of Knowledge." Dr. Gilbert (1978) further discussed this topic in his book entitled *Human Competence* (1978). He points out that in 1977 alone over $100 billion was spent on formal school education in the United States, and at least that much again was spent to prepare adults for jobs in the form of training in industry and government (p. 211). In fact, we spend more than twice as much to train people as we spend on defense in the United States. We are in fact "spending over $200 billion a year, half of which we probably don't even know we are spending. And besides we haven't the faintest idea what we are getting for our money, or whether we could get a great deal more. Yet we all have good reasons to be interested, because every cent of this money comes out of the public pocket, either in the form of taxes or hidden in the prices we pay for goods and services" (p. 212).

Dr. Gilbert goes on to point out that when we buy knowledge we really pay for three things: first, the analysis and development of the training program; second, the delivery of the training program; and third, trainees (included under trainees' cost would be wages, benefits, overhead, etc.) (p. 220). The distribution of these costs is summed up in table 16-1 taken from Dr. Gilbert's book. It shows that the distribution of these costs varies somewhat, but not much for different types of institutions. "The strange characteristic of this distribution of costs is that the trainee costs seldom appear this way in anyone's budget; they are usually hidden [within the development and delivery costs]. And, so far as I know, they never appear [separately] in a training department's budget" (p. 221). As a result, this, the largest cost factor, may not be clearly entered into management decisions about training. "It is as if a company, faced with the decision to construct a new building for its headquarters, looked only at the architectural costs" (p. 221). And indeed, far more dollars are involved.

> Second, the other two items, delivery and development, are budgeted and therefore come under periodic scrutiny. They therefore have to be justified. And because training is never (so far as I know) structured as a profit center, and because its values go unmeasured, the easiest way to justify it is to show that the budgeted money is kept busy—to demonstrate that you have used it to get as many

> people as possible to spend as much time as possible in a classroom. This is the measure demanded by the "subcults of knowledge and work": If an extra dollar is budgeted for training, there must be a corresponding increase in the amount of behavior expended. [There is nothing said about performance measures.] (p. 221)

TABLE 16-1

Distribution of Training Costs

	Trainee Costs	*Delivery Costs*	*Development Costs*
Typical institution	90%	9%	1%
U.S. company with the largest developmental costs	85%	12%	3%
Institutions with little or no formal training effort	95%	5%	0%

SOURCE: Reprinted from T. F. Gilbert 1978, p. 221.

Many managers, suspecting that the real costs of training are high, decide not to invest anything in formal training and instructors so they will not have any training costs. This turns out of course to be pure nonsense. Figure 16-1 is a graph of the growth of productivity when employees are left to learn on the job and by themselves (Gilbert 1976, p. 225). "The shaded area (TT) represents true training time; it doesn't matter that the training methods are informal. Employees have to learn anyway, and the true costs of that training are a function of the paid nonproductive time while they are reaching average productivity" (Gilbert 1976, p. 225). Although most managers don't realize it, "the formal design of training can greatly decrease that cost and increase the value, as figure 16-2 shows. In this figure, the area labeled (A) represents the fixed costs of formal training. The areas (A) plus (B) are the true costs of formal training. And (B) plus (C) are the true costs of on-the-job training (OJT). The added value of formal training is a function of the areas (C) plus (D), and area (D) is a value that continues over the years" (Gilbert 1976, p. 225).

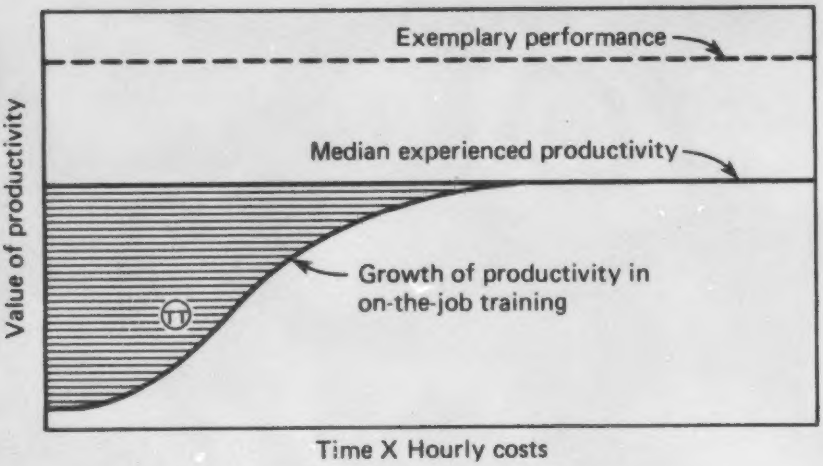

Figure 16-1. True training costs in on-the-job training.

SOURCE: Gilbert 1978.

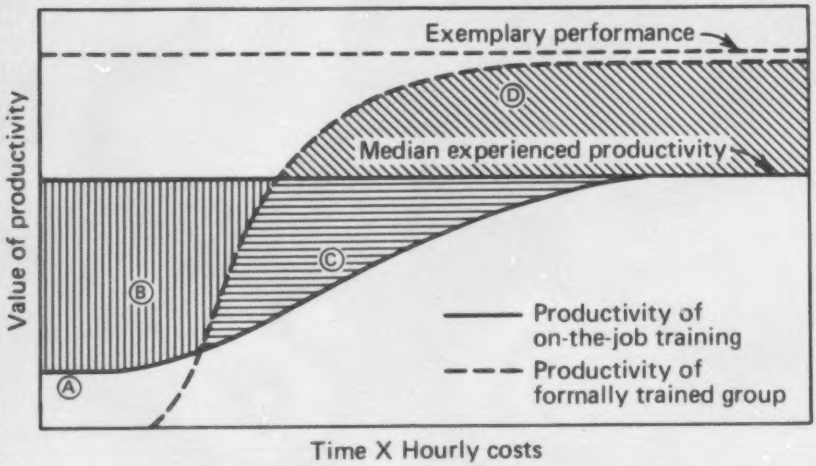

Figure 16-2. Differential training costs and value: design versus on-the-job training.

SOURCE: Gilbert 1978.

Another reason that companies do not train is that, unfortunately, formally designed training is seldom as efficient, as shown in figure 16-2. Figure 16-3 "represents a more typical case, in which formal training may not pay off because the costs of development, delivery, and classroom time cancel out any early gains in productivity. In this figure, area (A) represents fixed costs of formal training; (B), the value from earlier productivity resulting from formal training; (A) plus (C), the cost of formal training; (B) plus (C), the cost of OJT. You can see that gains could be tremendous if we just shift the curve to the left by reducing training time" (Gilbert 1976, p. 225). Unfortunately, in too few instances is that curve shifted as it should be when technical and skills training programs are designed in industry. To summarize, companies without any formal training pay for training forever because they do not do it. One of the principle reasons, if not the principle reason, that organizations do not invest in training, is that they view it as a cost. However, what they are viewing as a cost is only a small fraction of the actual training cost, most of which is found hidden in various other budgets such as the employee's wages during informal OJT or during the time they are simply coming up to median competency.

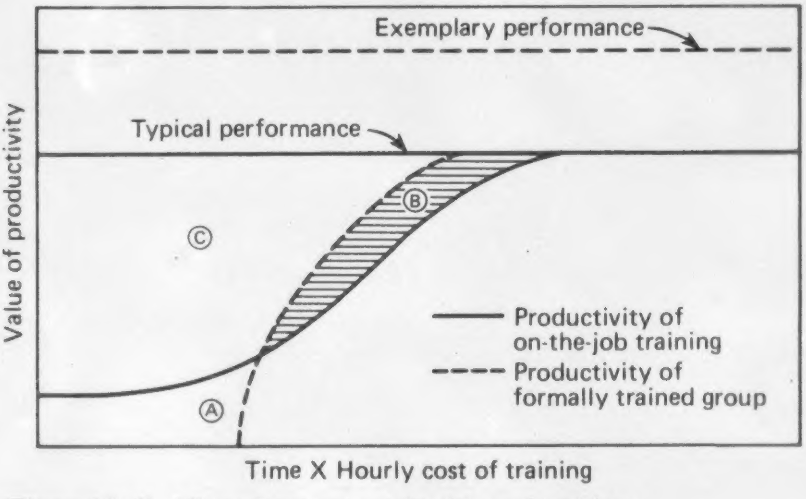

Figure 16-3. All too frequent result of formal training.

SOURCE: Gilbert 1978.

A second reason that organizations do not invest in training is that when formal training has been done the results generally have not been successful. Thus, managers have a dim view of the effectiveness of formal technical and skills training programs that were developed either by them or by outside sources. They do not seem to be able to measure marked gains in productivity, reduced scrap, or reduced machine downtime. Reasons for this situation will be discussed later.

A third reason more training is not done in business and industry is that training directors themselves do not view their operations as providing a return on investment or as a profit center. We know of few training directors who try to sell training to management based upon a return on investment. In fact, in the technical and skills training area, managers ought to be buying training based on return on investment much in the same way they would buy a piece of equipment based upon its return on investment. Of course, in order for training directors to consider their operations as profit centers that must provide a return on investment, they must have confidence that they can, in fact, produce effective technical and skills training that will provide such a return on investment. For reasons that will be discussed later, most training directors are not sufficiently confident that their efforts will produce a return on investment, and therefore avoid approaching management on financial terms.

Another reason that training is often not done in companies is that training directors responsible for technical and skills training report to the wrong person. These training directors most often report to the director or vice-president of personnel or human resource development rather than an operations manager. Thus, they often do not have access to the person most directly responsible for production. Without a direct reporting function to line management in the organization, the importance of technical and skills training is often not perceived and much more emphasis is placed on management training and sales training to the detriment of the technical and skills training function.

Finally, training being done in companies is strongly a function of the size of the company. The BLS Report (U.S. Department of Labor 1976) mentioned previously indicates that "The proportion of establishments offering structured training generally increased as employment size increased." Smaller companies often do not have either the financial resources or human resources to involve themselves in training. Since neither is available, they cannot design and develop in-house training. The lack of sufficient size also prevents them from having the financial resources to contract with outside firms to design, develop, and implement the training.

TRAINING TRENDS

Discussions and interviews with people in business, labor, and industry over the past several years have indicated a continually reduced dependence on schools to provide the training that is needed. They also have indicated an increased use of outsiders to design and develop their training. These outsiders, for the most part, are consulting companies that produce custom-designed programs or product companies that provide off-the-shelf training products.

The driving force for these trends is twofold: first, a lack of response by the schools to industry's needs, and second, the increased complexity of the equipment being used. People in industry are particularly strident concerning what they feel is a lack of response to their needs by the formal academic programs in vocational high schools and two-year technical colleges. They cite problems such as the school only wishing to offer courses that exist in the curricula. When they have asked schools to design courses for them that would be tailored to the needs of their particular plant or organization, schools in general have not been responsive. There are some notable exceptions. In one case with a southern United States manufacturer, a program was worked out between the plant and the school whereby some of the equipment required for the customized program was purchased by the company and given to the school, and in addition, the company provided some of the instructors for some of the more specific, detailed parts of the course. The school provided the basic equipment, an instructor to teach the basic parts of the course, classroom space, and an associate degree program for the program participants upon completion. These exceptions, however, are too few and far between as far as industry is concerned. On the other hand, however, few industries have gone halfway in helping the schools acquire the necessary resources to customize their courses. The example just cited is an exception indeed. The general situation is that the two entities, schools and industry, are talking past each other. Schools offer courses and curricula designed to teach rather generalized basic skills for the most part, and industry keeps asking for customized specific courses to meet their immediate needs. They seem to have little understanding of why they have not been able to help each other.

Labor has experienced much of the same problem with formal schools. This has resulted in the creation, by the unions, of a number of excellent schools in the various crafts and trades that they serve. Several good examples can be cited. First, there is the Francis L. Greenfield Laborers and Construction Industries Institute that is owned and operated by the Laborer's Joint Training Fund of Washington, D.C., and is located in Sterling, Virginia. This institute trains union members in various aspects of the construction trade and does an excellent job of it. A second example is the school run by the Seafarer's Union in Piney Point, Maryland. The purpose of this school is to train union members in the use of shipboard equipment and procedures aboard various types of ships so they can upgrade their ratings and perform efficiently aboard ship. This school also is extremely successful. In both cases trainees coming out of these schools are able to perform at median competency shortly after going to work.

The great difficulty in the school/industry training problem seems to be accountability. Schools, in fact, are not accountable for the most part to show that their training has accomplished anything. Industry, on the other hand, when it installs technical and skills training programs, expects to see the training accomplish something. They look for improved productivity and/or reduced scrap and/or reduced machine downtime. It is extremely difficult to obtain these accomplishments from programs that are generally basic-skills oriented and do not deal in specifics. As a result, the people being turned out by schools must first be subjected to specific training when they obtain a job. Schools have steadfastly maintained, for a long time, that it is not their job to train people for specific tasks but rather to provide them with the general background and basic skills required to work on any piece of equipment. Industry, on the other hand, which must account to its management for dollars spent on training, needs to show results from the training programs they have paid for. They are, in other words, accountable. The result of this situation is that industry has resorted to other methods of training rather than formal school training. More will be said about this later.

The second driving force cited for industry's reduced dependence on schools was the increased complexity of equipment in industrial applications. This problem is very much related to the first. When equipment was simple, a knowledge of basic skills went a long way toward helping to troubleshoot and repair equipment. When equipment was simple to operate, for example, a typewriter versus a word processor, it was again not a great jump from the basic skills one had learned in typing class to the use of a typewriter in an office. Today, equipment is automated, high speed, multifunctioned, and generally driven by complex solid-state electronics. This modern equipment is not easily analyzed and repaired. Basic skills in electrical troubleshooting or even in digital electronics are not likely to allow one to troubleshoot a highly sophisticated piece of equipment. The same is certainly true for various types of operators.

A word processor is capable of many sophisticated operations in addition to just typing. It can be used to search and sort, automatically address labels, justify margins, and a whole host of other applications. Learning basic typing skills will hardly touch 5 percent of a word processor's capability. If a company has a large number of identical word processors, then what it really needs is training specific to that piece of equipment. One might ask, does the manufacturer provide that training? Experience, once again, has shown that what is provided by the manufacturer is usually a rather perfunctory approach to getting operators started on the equipment. Training usually will last several days to a week, and the operator will then be able to perform the most basic functions. Learning the rest of the secrets of the word processor will be left to the operator, who must work from the manual that has been provided with the machine.

The same is true in the maintenance function. The new, highly sophisticated equipment that is being installed in plants usually comes with equipment manuals that are insufficient as far as the maintenance function is concerned. Furthermore, the training provided by many manufacturers is usually slanted more for the engineer than it is for the mechanic who must keep the equipment running. In many cases, industry is left with virtually no place to turn; and in desperation, firms either develop their own courses, which are many times not very effective, or else seek outside help in the way of consulting firms.

This then is the dilemma that currently exists between schools and business, labor, and industry. It has led to a trend for the development of specific training and away from the generalized and more basic skills provided by schools. Not only is industry being forced to this decision in order to survive, but in fact, companies have found that they can bypass the basic-skills training if the machine-specific training is good enough to get the job done. They may need only to fill in small pieces of the basic-skills training to support the machine-specific training, rather than to provide entire courses. The solution to this problem is a most difficult one and will be discussed somewhat later in this chapter.

TRAINING STRUCTURE AND FUNCTION IN INDUSTRY

It would be helpful to look at how training is structured and how it functions within companies. We have already said that training organizations will usually be found in organizational charts most often under the personnel department or the human resource development department, depending upon the company. To a much lesser extent it will be found occasionally, if it is heavily involved in technical and skills training, under the operations or manufacturing department.

The training departments may be structured to function in various environments. There may be training centers at either the corporate level or at divisional levels. Training centers may, in fact, be in separate buildings completely isolated from the rest of the company's buildings, or sometimes they simply utilize space in either a corporate or divisional headquarters. In many manufacturing companies training is decentralized to the various plants. In this situation the training is often done by a plant supervisor since the plant may not have a full-time training person. This fact is verified by the BLS report (U.S. Department of Labor 1976) that indicates that only 2 percent of the 99,300 training instructors taught on a full-time basis. The rest had other duties, many of which were of a substantial nature. The report also goes on to indicate that about five-sixths of the establishments that were doing training did not have a specific budget allocation for training. Since no allocation existed, supervisors and other plant personnel were used for the training because they did not require separate budgeting. Once again, here is an example of the hidden cost of training.

A PROFILE OF TRAINING DIRECTORS AND TRAINERS IN INDUSTRY

The training department of a company is often a "way station" for someone on the way up or way down in the hierarchy. It is not unusual to find a person nearing retirement given the responsibility for training in a company. It is also not unusual to find some bright young engineer on the way up asked to take over the training function in order to solve some existing problem that a manager thinks training will solve. For neither of these types of people, and thousands of others like them, is training a profession, nor is it their intention to remain permanently in that position. Yet, over and over again, this is the situation that we encounter throughout the country.

That is not to say that there are not training professionals in these positions. It is to say that we have found them to be in the minority, rather than the majority. In our work with the Technical and Skills Training Division of the American Society for Training and Development, our membership surveys of the division constantly indicate that there are new people without any training experience being given responsibility for the training function. They have come to the division for help in learning the most rudimentary basic-training skills in order to be able to survive in their new jobs. There are few training professionals remaining in the training function who have joined companies early in their careers and have worked their way up the company ladder. Many of the people at the top of the training hierarchy in the various companies have come to the training function from other disciplines. In summary, at least in the manufacturing industry, the director and trainers are most often technical people who have little if any program design and development experience, but who have rather come to the function by default. Many of these people never remain in the function long enough to learn how to design effective technical and skills training programs. Thus, industry is faced with an additional program; that of having their training function manned by people who are not training professionals.

To summarize, there is a variety of reasons for the generally low stature of training departments in industry: (1) training departments' position in the organization, which we have already discussed; (2) the generally held view that training is costly and to be avoided; (3) the inability of trainers to communicate their worth to management or the plant work force in terms of dollars; and (4) the ineffectiveness of much of the training they do because many of them are not training professionals. In addition, if they are training professionals they are often not considered to be in a legitimate discipline by the technical people in the company. This is especially true in a company that has a heavy engineering orientation. Finally, they do not have an official national body for recognition or certification. In recent years attempts have been made and studies are going on concerning the development of certification programs for technical and skills trainers in industry. The American Society for Quality Control faced the same problem a number of years ago and painstakingly developed a certification program for quality control personnel. The results have been that quality control people are now certified by ASQC, and the certification carries a great deal of weight within their companies and when they move from company to company. It may be that a similar approach is needed for technical and skills trainers in order to enhance their credibility and position within their companies. However, before that can be done the competencies in the field must be identified.

THE DEVELOPMENT AND DELIVERY OF TRAINING IN INDUSTRY

Given the large variety of training situations that exist in business, labor, and industry, training is developed and delivered in a number of ways. In companies with a large training commitment, training will be developed and delivered within the company. However, even these companies usually resort to outside sources for some of their training, especially in cases where specialized skills are needed. A good example is AT&T, which probably has the largest training commitment in the country. AT&T spends approximately $1.7 billion a year on training. Although a great deal of that training is developed and delivered internally, the company depends heavily on outside contractors to develop and deliver training. Many companies, in an effort to reduce training costs, rely on off-the-shelf programs that someone inside the company can use for instruction. These programs are more generic in nature than a custom-designed program but are often more specific than the basic-skills courses taught in schools. If custom-designed programs are required, and the internal capability to develop and deliver them does not exist, companies will turn to outside developers to develop the programs and often to implement and deliver them. Sometimes they will ask only for development of the program by outsiders and then take over the implementation and delivery themselves.

In manufacturing industries especially, a popular training option is to send employees to the equipment manufacturers' schools. This can often be an expensive way to obtain training since the employee will have to go to where the manufacturer is located in order to go to a one- or two-week training session. The company must bear not only the cost of the tuition, but the employee's living and travel expenses while away from home. However, if the organization is large enough, the manufacturer will usually be willing to set up a school at the company's site. Instead of being sent to manufacturers' schools, trainees are sometimes sent to special seminars and short courses on specific topics. An example might be a short course on the use of lubricants for machiney. These short courses and seminars are often offered by consulting firms and are given a number of times in various locations across the country. Finally, trainees are enrolled in formal programs in vocational schools and various types of technical or community colleges. These courses or programs usually deal with basic skills.

TRAINEE COMPETENCY

The lack of competence among the work force, especially in technical and manufacturing industry, is of great concern. Managers and supervisors constantly complain about a work force that has poor verbal skills and poor basic technical skills. There is, in fact, in this country a dearth of trained people. The American Tool and Die Association estimates that there is currently an annual shortfall of some forty thousand machinists. The shortfall is growing, not only for machinists, but for skilled electronics technicians and electricians, and competent mechanics. Industry is being forced to train its own maintenance personnel in order to keep its plants operating.

The general low level of competence in the work force has made the technical and skills training job even more difficult. Training materials must be designed so they require little reading or writing. The material must be highly graphic, the information must be compacted into as few pages as possible, and as much information as possible should be transferred by means other than the written word. Many companies have compounded their difficulties by moving out of those geographic areas where there are skilled personnel to areas where only unskilled workers are available in an effort to take advantage of various incentives and tax breaks. They find themselves faced with the prospect of training an entirely unskilled work force to run a relatively complex plant. In desperation they try many stopgap training measures, most of which do not work. Thus, industry finds itself faced with a largely untrained work force and insufficient technical training to increase workers' skills.

INDUSTRY'S MAJOR TECHNICAL TRAINING DILEMMAS

The dilemma faced by industry as far as technical training is concerned can be stated in two parts. First, companies cannot easily find technically competent people to maintain and operate equipment, and second, where they do have technically competent people, the increased sophistication and complexity of the equipment is causing people who were previously competent to be unable to cope with the problem of analyzing the equipment.

Let us consider the case of technically competent maintenance people at Ford Motor Company when significant changes in the equipment were made. The tradespeople who maintained the equipment on the transfer lines at Ford Motor Company had come from apprentice programs and were competent card-carrying electricians for the most part. The automotive industry in recent years has been forced to automate its plants to the greatest extent possible. Companies have installed robots on the lines, and more recently, they have installed programmable controllers to actually control the long transfer lines in an assembly plant. Ford, realizing that its electricians knew little about digital electronics and even less about programming and how a programmable controller would work, decided that training was in order for these people. In attempting to help them, Ford contracted out for the design of a programmable controller course, which would include a simulation of a generalized programmable controller to teach their people the principles of how programmable controllers work and what they do. The course was a great success; that is, it was a great success until Ford's electricians had to analyze the problems when the lines stopped by looking at the lights on the programmable controllers. It soon became evident that the generic training did not transfer well enough to the specifics of the programmable controllers installed in the assembly plants. Ford, at that point, decided to develop training that was specific to the programmable controller models that they had in their plants. In fact, where they had two or three different models of the same manufacturer's controller, the training was developed to be specific to each of the models. Once again, Ford contracted out for this training since the expertise did not readily exist internally, or at least was not available. The results of the specific training for the controllers are not yet available since the project is in process, but the case is one that we have found repeated over and over again throughout industry. In this particular instance, highly competent electricians who already had all the basic skills, either through apprenticeship training or journeyman-level experience, were unable to cope with the newer, more sophisticated equipment.

Thus, one of industry's major dilemmas is, even if people do have the basic skills—that is, they are well trained to be electricians, plumbers, or mechanics—the chances are high that they will not be able to deal with the more sophisticated machinery that is being placed on plant floors or in offices. Of course, the same problems occur with operators, whether in plants or in offices. The person who is an extremely competent typist will become at least as competent a typist on a word processing machine, but the ability to cope with all the other functions of the word processor has nothing to do with the basic skills of typing or office management. Word processing machines are capable of so many functions, as has been stated, that it is a fair estimate based upon our experience that only about 10 to 15 percent of the capability of the word processing system is used in any one office.

If competent people are having difficulty coping with the new equipment and the new systems, what then can we expect when people who do not have the basic skills are asked to work on such equipment and machinery? Experience in many industrial situations has taught us that the results can be disastrous. Yet, the availability of competent mechanics, electricians, and other tradespeople is such that industry must function with people who do not have the basic-skills training.

The next question that then arises as far as industry is concerned is, how shall we train these people to bring them to a level of competence that is acceptable? This leads to what I like to call the short-term, equipment-specific training approach versus the long-term, basic-skills approach. The assumption with long-term training in basic skills is that you will eventually produce a person with sufficient skills to work competently on a wide range of machinery. In practice that may or may not turn out to be so. It depends heavily on the type of activities and tasks in which the person is involved. If we are talking about skills in carpentry, for example, the chances are very good that people will be able to transfer those basic skills effectively to the job. On the other hand, if we are talking about troubleshooting and repairing sophisticated equipment of many different types, the basic skills do not transfer well at all to efficient and effective work. There are many situations in which the basic skills, whereas they will help, cannot by themselves provide the necessary background for the tasks at hand.

Another problem that exists with this long-term training approach, of course, is that industry must wait a long time to get a payback on its investment. In either an apprentice program or a basic-skills program, through some kind of formalized school program, it will be at least several years before people are trained to a level of skill where they can work on the sophisticated equipment. Often, especially in manufacturing plants, industry's needs are more immediate than this. In fact, they are sometimes critical, and the survival of a particular plant site or a company can depend on its ability to produce a quality product and get it out the door.

A third problem that exists with this long-range basic-skills training is that the people being trained now have skills that are easily transferable to another company or another industry. A question that often arises concerning apprenticeship programs and long-term basic-skills training in industry is, "Why should I train them for the other guy?" This indeed can be a hard question to answer. The industries in which long-term basic-skills training has worked have been those that have had the highest pay rates in the country or in their immediate area. If a company has relative confidence that it will not lose a worker once it has invested in long-term training, it is less reluctant to do so.

Good examples of industries that have done this are the automotive industry and the steel industry. However, automotive and steel workers are among the highest paid workers in the country. There is little chance that automotive workers are going to move to some other industry, unless they are laid off, because their pay would probably decrease. In some cases a company may be the only game in town, so to speak, and although its pay scale may not be the highest by national standards, it has essentially a captive work force and is not concerned about large turnover due to other industries attracting its workers. In that case, long-term training may be a viable solution.

However, the majority of companies do not find themselves in these positions. Therefore, they very often opt for a short-term solution by designing equipment-specific training. The purpose of this type of training is to train employees to operate and/or maintain the specific pieces of equipment the business utilizes. The training is usually designed on a need-to-know basis. Employees, for example, would not be taught general blueprint reading or mathematics skills but rather how to read the specific blueprints they must deal with and how to make the few calculations on a small handheld calculator by being given a series of key pushes. Never mind the theory behind them. Troubleshooting and procedures for operating and maintaining equipment are handled in much the same way in this type of training. Heavy use is made of specific decision trees and procedures, using graphic materials, to deal with that specific piece of equipment.

Although this approach may be somewhat abhorrent to an educator, it has the ability to bring quick, short-term gains to industry if the training is carefully designed. It also has an additional benefit to the company, although not to the worker. That is, the skills are not readily transferable to another employer, and hence, the company has less of a turnover problem. This type of training usually involves the design of nonverbal materials that can be used by people with little skill. The author, for one, has designed such programs for many industries and has described the process in a previous paper (Holden 1980). The system for short-term training usually relies heavily on job performance aids rather than formal training. The training segment is done mainly with the use of audiovisual modules of some type, whether they are slide/tape, video, or film. The job performance aids are used at the work place and have great benefit long after the more formal audiovisual portion of the training has been forgotten or pushed into the hazy past. This rather narrow approach to producing results is usually cost beneficial to industry. The return on investment is usually substantial, something that cannot always be said for a long-term basic-skills training approach.

Industry continues to wrestle with the long-term training versus the short-term need-to-know approach. However, as the equipment gets more complex and keeping it maintained becomes more difficult, there seems to be a shift toward more and more short-term training to maintain specific pieces of equipment. If the return on investment due to the measurable gains in productivity, reduced scrap, or reduced machine downtime can be shown to be sizable, industry is encouraged to continue to do training of this type.

SOME POSSIBLE SOLUTIONS

Solutions to some of the problems stated in this paper are not simple. They require imaginative thinking and a great deal of cooperation from all the sectors concerned with improving technical and skills performance.

A view held by a number of people with experience in various industries is that a first requirement for improving training in industry is a change in management philosophy. The United States has long indulged in a year-by-year management philosophy. This philosophy leads to a "get the good numbers this year and never mind about next year" approach. One of the results of such short-term management goals is that training dollars are viewed as a cost that will not have an immediate return and, therefore, will not make the managers' performance for that year look better, but instead may make it look worse. As long as this short-term philosophy prevails there is going to be difficulty in getting companies to invest in training to the extent that is required.

The solution to the problem in part entails investing more money in training development. What must be done to make the design of the training course more efficient will simultaneously reduce the amount of trainee time as well as increase its impact on job performance. Unfortunately, under current management philosophy in the United States, managers are not inclined to invest substantial dollars in training development whether it is within their organization or externally with schools or independent contractors. There is evidence that this philosophy is beginning to change, that one-year bonus systems are beginning to be examined critically within American companies. There are indications that a long-term, perhaps five-year performance appraisal for managers, will be instituted in some of the larger corporations in the near future. Once managers become aware that their performance will be appraised on a long-term basis, they should be more inclined to invest in those things such as training that will show improvement several years down the road. It cannot be emphasized too strongly that unless this change in management philosophy comes about, trainers, whether they are internal or external to an organization, will be forever fighting an uphill battle for the dollars necessary to create effective programs.

A second possible solution is to improve school-industry linkages. However, just as management philosophy is an impediment in industry, the lack of accountability in schools is detrimental to establishing linkages with industry. Unless and until schools are willing to come out of the classroom and into the plants part of the time, there is little hope they can provide the kind of impact needed by industry. That means being accountable for the training they are giving by following the workers into the work place and working with them until they can operate effectively in the work environment. They must, in other words, be held accountable for their training by showing that it will, in fact, help the industry with which they are working.

There are some good examples in existence of this type of linkage. One of them is the University of Texas in Austin, which works extremely closely with the petroleum industry. The University of Texas has established a center, usually called PETEX, which offers courses at various levels to petroleum industry employees. They even offer courses to roustabouts on safety and federal regulations when working on rigs. They have installed simulators for hands-on activities in rig and production operation. They also work closely with the American Petroleum Institute. There are some other similar linkages that exist on an industry-wide basis. Unfortunately, such successful school-industry linkages are not common.

Of course, all the responsibility for such linkages should not be placed upon the schools. Schools have neither the financial resources nor the staff to provide industries with the kind of services they really require. It behooves industry to aid schools by providing financial support and some of the instructional staff for the more specialized parts of the courses. One good example of this arrangement has previously been mentioned in the case of a plant in Tennessee, where the local two-year technical college and the local industry designed a curriculum to train maintenance personnel to maintain the specific machines that were used in the plant. The curriculum was a combination of basic-skills training and material specific to the equipment. The staff from the college taught the basic-skills portion of the course, and staff from the plant taught the specific-skills portion of the course. The company bought the equipment necessary for teaching the course and provided it to the school in the form of a grant. At the end of the program the school received title to the equipment and was allowed to keep it. The school also awarded a two-year associate's degree to the maintenance personnel who took the entire program and successfully completed it. Both the school and the company received a great deal of benefit from the combined effort. Thus, it was a win–win situation. More solutions similar to this one are required if school–industry linkages are going to be successful. These solutions should be local in nature, between a specific plant and a specific institution.

Several linkages have been developing with industry that seem to be most beneficial. The first of these is industry associations. A good example, as mentioned previously, is the American Petroleum Institute (API). Its committees have contracted for training development on problems common to the industry concerning production and drilling equipment. They have had high-quality programs developed by outsiders, either private firms or schools, and have then distributed them to the API membership.

Exactly the same approach was taken recently in the maritime industry. A new set of international rules concerning tankers was put forth in the last several years. Due to these new rules there was a need for an industry-wide training program for both unlicensed and licensed personnel aboard tankers. The companies picked one member of the group to act as contact point and then contracted with external sources to provide a large amount of training in all aspects of tanker operations, paying particular attention to mandated requirements and safety. All companies involved contributed money to the pool and received a certain number of copies of the program when it was finished. There is little reason why schools could not be heavily involved in these types of activities if they have the desire to participate. However, in such programs there is a high degree of accountability and a high expectation for results. Unless schools are willing to meet these requirements, they will find it difficult to compete in this marketplace.

Several other school linkages have been devised to serve specially mandated programs. For example, the Nuclear Regulatory Commission has required certain kinds of training for nuclear plant personnel. Although the training is below degree level in some cases, that training has been provided occasionally by colleges and universities.

These isolated examples of linkages that have been discussed, some with schools and some with other types of organizations, are not frequent enough to constitute any type of ground swell trying to help industry. A great deal more activity is needed in this area.

Some internal changes are required, besides management philosophy, within organizations themselves. Until a business approach to training, showing a return on investment for management, is developed more universally by training departments and training directors, it is unlikely they will obtain the level of support required to do effective technical and skills training within their organizations. In a way, many training directors fear accountability and therefore are reluctant to approach management on a financial basis. Another key to obtaining better technical and skills training in industry is dependent upon organizational structures. When technical training functions report to operations or manufacturing managers, they have much more success in obtaining funding. When they report to personnel or human resource development managers, their success rate for technical and skills training seems to be greatly reduced. It is important that training departments and training directors responsible for technical and skills training interface intimately with the line management people responsible for producing the product, whatever that product might be.

Finally, there are always the government solutions. These are not my favorite solutions because somehow they often seem to go awry in spite of their good intentions. I think this results often from the fact that the programs are too large and the number of people available to monitor them too few. In England, The Industrial Training Board provides tax advantages to companies that involve themselves heavily in training. I believe that the idea is to tax all industry of a certain level and then collect that money unless companies do training in an amount equal to what the tax would be. Of course, the problem is how to measure the training, by pounds of books produced, by number of minutes of videotape, or by its effectiveness on productivity? Certainly the government will be hard pressed, with the number of people involved, to monitor such programs in order to make intelligent decisions in these areas. Thus, as in this country, payment is likely to be by some formula that will not really address the effectiveness and quality of the training. Yet it cannot be emphasized too strongly that you can already buy as many pounds of training as you wish, as many minutes of videotape as you wish, and yet, it does not seem to help industry get its job done. Unless the effectiveness of training is measured in performance terms, the sought-for improvements will remain elusive. Too long have we measured incorrect parameters in technical and skills training. I have learned not to trust paper tests as an indication of performance. They are only an indication of knowledge level and are often based upon a person's verbal skills ability. I would not know how to track the kinds of things that must be tracked to measure training effectiveness in a massive program run by the government.

Solutions to the existing problems are not easy. They require some major changes in philosophy and thought, and they require a substantial effort on the part of a number of different segments interested in addressing the technical and skills training problem. Some of the solutions offered already have noteworthy examples in existence. It would be profitable to study those models to see how well they really work and how they can be improved upon, and then to try to promulgate such models throughout the country.

FUTURE TRAINING IN BUSINESS AND INDUSTRY

What are the projections for future training in business and industry? The answers to that question are somewhat subjective and depend upon the perspective from which one has viewed the past progress. The projections for the future given here are those of a practitioner with wide experience in business and industry. They are based upon trends that I have seen happening and growing throughout the course of my work. They are also based on technological advances that are occurring in rapid-fire fashion almost daily. And finally, they are arrived at by considering the needs that now exist in business and industry.

First, there will be more and more need to provide training in business and industrial applications. This need will be driven by a greater and greater use of sophisticated equipment, a continued decline in the availability of a skilled work force, and the more highly competitive nature of business as international companies market against us. The need for more efficiency, more productivity, and lower costs in producing products will require more and more training. Unfortunately, in my view, this country is not currently geared up to provide all the technical and skills training that will be required. Curricula will have to be developed in colleges and universities that are cooperative in nature with industry in order to create training professionals capable of producing high-quality technical and skills training programs. Since the skills necessary to work effectively do not exist in the work force, labor, in order to protect jobs for its people, will write into future labor agreements more detailed training requirements on the part of industry. In some cases the training will be done by industry and in others, industry will be required to provide funds for schools and institutes run by the unions themselves.

Industry associations will also provide increased training on specific equipment and specific processes within their industry, once again funded by the member organizations of that industry. In fact, industry, labor, and industry associations will all focus on producing training that is more and more equipment specific as the equipment gets more and more complex. In the future, we believe that one can expect to see a much greater emphasis on equipment-specific training and a decreasing emphasis on basic-skills training. The overriding reason for this will be industry's need to get a short-term return on its training investment in a highly competitive world. The luxury of long-term training programs will not be available in many industries. Studies are likely to show that this short-term training approach is much more cost-effective in business and industry. Schools that wish to participate heavily in technical and skills training in industry will have to focus a portion of their efforts on equipment-specific training.

Delivery systems for training will become more sophisticated by utilizing devices such as computers and videodiscs. The technology exists today to interface the new videodisc systems with a microcomputer so that one can simulate a large variety of activities. This interactive video approach gives trainers the capability of real-life visual displays with computer instruction and branching techniques being used simultaneously. These systems also allow for excellent student record-keeping capability and item analysis for training program improvement. We have done some work in this area and a short report was written by Jerome Peloquin (May 1980) for *Northeast Training News*. Peloquin's article points out that it is possible to visually simulate a large number of systems using such a universal interactive video simulator. Valves can be opened and closed by trainees touching the video screen, actual pieces of hardware can be depicted with overlaid arrows pointing directly to what is being emphasized, and different computer programs can be used with the same visuals to train different levels of people. A result of these new delivery systems will be that training will become more individualized and self-instructional and will be less instructor led. More time will be spent in program development, with the student being led through the training by computer-driven systems, while the computer keeps score and notes the exact path students followed by moving through the training. This system will also direct trainees to hands-on activities on simulators and mockups located close by. New trainees or existing employees who are having difficulty with a part of the system will be directed to that particular part of the training Training will be available at any time their schedule allows.

To support these more sophisticated delivery systems, careful design and development of technical and skills training programs will be required. There are not now sufficient numbers of trained instructional designers who can work with such systems. In fact, there is probably only a handful in the country today. Emphasis among training professionals will shift from presentation and delivery, to instructor-led courses and classroom work, to program design and development.

These changes have great ramifications for schools as well as labor, business, and industry. The time is already short to begin to address them.

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Training: The Polaroid Experience

INTRODUCTION

It is obvious that business and industry are playing a greater role in education and training than ever before. The *New York Times* recently devoted a complete supplement to the expansionary practices in education of General Electric, Xerox, Prudential, and IBM. The *Wall Street Journal* carried a front-page story on the efforts of private and public schools to attract corporate participation, in competition with consultants and the corporations' own in-house efforts. And anxious academics have been fretting over large computer companies' intrusions into the degree-granting provinces they once held sacred to themselves.

And so the battle rages as charge and countercharge are hurled across the valley of dearth as to who is to blame for our loss of productivity, declining lead in technology, suspect product quality, and a general disintegration of our nation's quality of work life—whatever that means today.

In an article written twenty-three years ago for the *Harvard Business Review*, anthropologist Margaret Mead (1958) suggested that industry should play a major role in the revision of our educational system as she posited the proposition that "industry has the peculiar advantage of understanding the major evil from which our whole educational system is suffering—obsolescence" (p. 28).

In the years since that article, industry spending in the education and training arena has increased in multiples of tens of billions of dollars and now is a potent force in shaping the adult education picture in the country.

But I am not convinced that our return on that investment is commensurate with our expectations. In a recent article (Pascarella 1980), Fredrick Herzberg accused corporate participants in training programs of being "seminar junkies." My experience tends to support this notion, as I witness participants filling up on superficial experiences that absorb financial resources and grant illusions of learning.

Let me be perfectly clear that I am not so impressed with my own sector's achievements in the educational field as to present you with a model of how it should be done. I am convinced, however, that the profit motive to educate and train is a valid one, and a strengthened alliance between industry and education is in our best interests.

This paper is an attempt to reveal new and innovative techniques or approaches used or recommended by Polaroid in establishing creative links between schools and business. It is hoped that, as I discuss our philosophy (Does philosophy really have a place in vocational education?—I think it does.) and our experiences and relationships with others, a picture will emerge of one company's attempt to meet the needs of the organization and the individual through its employee development activities.

Dr. Edwin H. Land started Polaroid in 1937 as a research enterprise in light polarization. Polaroid is still selling polarizing lenses, but our major efforts are now dedicated to research, design, manufacturing, distribution, and marketing of instant photographic and related products. In 1980, worldwide sales were over $1.5 billion.

More than twenty-five years ago, Dr. Land, in talking about education and training in the company, said that "the function of industry is not just the making of goods; the function of industry is the development of people." In describing the environment he wished to create at Polaroid, Dr. Land enunciated the company's philosophy:

> We have two basic products at Polaroid:
>
> Products that are genuinely unique and useful, excellent in quality, made well and efficiently, so that they present an attractive value to the public and an attractive profit to the Company.

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> A worthwhile working life for each member of the Company—a working life that calls out the member's best talents and skills—in which he or she shares in the responsibilities and the rewards.
>
> The two products are inseparable. The Company prospers most, and its members find their jobs most worthwhile, when its members are contributing their full talents and effort to creating, producing, and selling products of outstanding merit.*

I believe it is important to understand and recognize this philosophical cornerstone to our enterprise as key to our energy in human resource development. The commitment by top management is an endorsement of efforts in this area, but it is also a signal of attention and critical review.

Polaroid's total employee population is just above 16,000. In the United States, we have 13,000 nonunion employees, most of whom work within fifty miles of Boston. About 30 percent are management personnel and about 70 percent are hourly workers.

Last year the Human Resource Development (HRD) Group, under which all employee development programs take place, served or supported over 6,000 employee enrollments in several in-house programs and in tuition assistance for local postsecondary institutions. In-house programs and services are offered in business education, language development, career development, fundamental skills, management development, and skills training.

One of the most important things about Polaroid education is the parity between management and worker. Most companies with both hourly and management development programs offer more than 80 percent of their services to management. In fact, more money is spent on education every year by industry than is spent in the entire nation on postsecondary education—and most of that is spent in management development programs (Goldstein 1980). Paying attention to that parity is just good business.

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* E. H. Land, Polaroid employees' meeting, December 21, 1959.

Another unique factor of our programs is participation. The best known reimbursement education package for blue-collar workers averages .1 percent participation. The average for community adult education programs is 2-5 percent of the target group. At Polaroid the rate of participation for hourly development programs exceeds 30 percent.

The Human Resource Development Group supports the belief that learning is a lifetime process and that nonformal and formal education are needed by individuals in order to cope with rapid technological and social change. The challenge to the Human Resource Development Group is to anticipate the competency requirements of the corporation and to provide, where lacking, the appropriate education and training to our employees to meet those needs. We must address those areas where the needs of the individual and the organization become inseparable, for to do otherwise would do justice to neither.

Specifically, the goals of the HRD Group are as follows:

- Re-involve adults in education
- Assist individuals with the educational portion of their career plans through education and career counseling
- Prepare employees for more advanced education in local schools and colleges and cover costs through the Tuition Payment Plan
- Provide relevant programs and courses within the company to meet specialized educational needs of individuals and departments
- Link literacy, skills training, and various forms of informal education for employees with brief educational experiences to improve their functioning in the work force
- Continue to design efforts to get a better return on educational expenditure through the active involvement and experience of employees at all levels of the company in the educational process
- Make all in-house education for hourly and salaried employees relevant in the content, more active in method, and more functional in results

Polaroid is a highly technical and innovative company. Continued success requires that we stay in the forefront of research and development in such diverse fields as chemistry, optics, electornics, and coating technology. To ensure our success, Polaroid wants employees who understand what they are doing; who can see how their tasks fit together to form a whole; who can work with management to improve the product; and who have the theoretical and conceptual skills to grow with their jobs and the corporation.

To this end, we have developed a systematic and comprehensive series of hourly and salaried courses and programs, based on these principles that guide much of what we do:

1. We define an employee as "a resource that is never fully developed" thus supporting the notion of lifelong learning.
2. Salaried employees specifically, yet all employees generally, have a responsibility to teach others—establishing the basis for an in-house faculty as large as our population and as diverse as our technical and management expertise. Anthropologist Margaret Mead called this "the lateral transmission of knowledge," "a sharing of knowledge by the informed with the uninformed whatever their ages."
3. Individuals must assume a major share of the responsibility for their career aspirations. The findings of a study done by the National Center for Research in Vocational Education on competencies for employability (Selz 1980) indicate that the responsibility for teaching functional competencies related to work and working are shared by the home, the school, and the employer. To quote the report, "Also, where employability skills should be taught is not necessarily where they are actually learned. For the most part, where they are learned is on the job" (p. viii). Although this study focuses on the responsibility for teaching, the message which requires equal reinforcement is that responsibility for learning rests solely with the individual and needs to be addressed early in the home, in school, and at work. The capacity to expand intellectually, socially, and economically lies primarily with the individual. The role of the corporation is to provide the forum for this expansion to the degree that it is consistent with business priorities.
4. Most programs should involve a combination of in-house training, outside education, and on-the-job development—furthering the concept of mutual support and responsibility between the employee, Polaroid, and external institutions.

Over the past few years, our emphasis on individual commitment to learning and the integration of external education components into our programs have resulted in a number of liaisons with positive results. I would like to share three with you, all targeted for hourly staff members.

POLAROID TRADES APPRENTICE PROGRAM

This is a three-year program requiring on-the-job training at various sites and shifts, up to 300 hours of internal skills training courses, and 700 to 900 additional hours of technical training at educational institutions. Those who successfully complete the program are guaranteed jobs in the skilled trades at Polaroid. Competition for these positions is at a rate of ten applicants for every opening.

POLAROID SUPERVISOR TRAINING AND EDUCATION PROGRAM

This program's objective is to provide selected hourly participants with a transition from *doing* to *leading* by acquisition of college-level education in science, business, and the humanities; and skill development in Polaroid technology, human relations, and administration; both supplemented by job experience. Approximately 240 hours per year of this two-year program are devoted to internal training programs, and 120 hours per year are spent at Boston University.

POLAROID INTERNAL CO-OP PROGRAM

This reverse co-op program gives hourly employees an opportunity to earn a bachelor's degree from Northeastern University in one of several technical disciplines while maintaining most of their base income, while providing the corporation with a vehicle to fill a portion of its growing demand for technical people with those who have experience working at Polaroid. Candidates must go through rigorous interviews, testing, and reference checking and, once in the program, they must remain in the top one-third of their class. The design of the program calls for combining full-time Polaroid work assignments with full-time college study periods over five years on an alternating basis.

Whereas these programs represent our extended development opportunities, many more nondegreed employees are beneficiaries of the dozens of associations that have been formed with outside educational institutions to satisfy our corporate needs in word processing, secretarial, drafting, computer programming, and photoscience training.

Central to any analysis of our efforts to work with postsecondary schools seems to be the fact that the impetus for the programs had to come from Polaroid. This is not to denigrate the efforts of institutions; rather, it identifies a level of suspicion on our part regarding off-the-shelf, cure-all programs offered by both public and private vendors, while at the same time it allows us to maintain a sense of control over the content and quality of the program because it is initiated in-house.

As we began to assess our successful negotiations with non-Polaroid agencies, a number of elements became apparent. Considerable early effort was spent to ensure the relevance of the courses to the job that was to be performed by the employee. Each activity began with an evaluation of the institution's resources to provide capable instructors and materials and an insistence that predetermined standards of performance be strictly enforced. Once the program was in place, a continuing assessment of the institution's program by the participants and our coordinators was made and the results communicated to the institution. Also, in every successful program, the school had active partnership in the planning and administration of the total program. And finally, we attempted to convey the principles and philosophy upon which our interest and activities were built, so that the institution could join us in meeting those ideals.

Although the preceding comments have dealt with institution-to-institution relationships, additional arrangements are often made for instructors from surrounding universities or technical schools to teach in Polaroid's internal education programs, offering everything from fundamental skills to economics. These paid positions achieved the mutuality of benefit that many of us can merely conceptualize. Polaroid was able to draw on the experience of the professional educator to provide its employees with skilled instruction. The real experience of dealing with the corporate culture, its changing demands, and its idiosyncracies helped to update instructors in their subject's relevance to the worker and work environment.

Whatever the arrangements, Polaroid seeks those involvements that are built on an ability to enhance both parties' (corporate and external training sources) reputations for delivering quality products, and avoids duplicating externally available, cost-effective, quality programs.

Enveloping all of our courses, seminars, and programs, however, is the issue of career choice. To be effective in future endeavors, this important area needs special attention. Assistant Commissioner for Public

Affairs Patricia Cahn, in the U.S. Department of Education, was quoted as saying, "Education and the business community could mutually benefit from a partnership that gives young people first, a chance to learn about the 20,000-plus careers available in America, and second, the academic and career-related training to succeed in their chosen field" (Findley 1973, p. 16).

Unless business becomes clearer about what career competencies will be required in the next five to ten years, our educational institutions will always be struggling with Margaret Mead's concern with obsolescence. A modest proposal would be for business and industry to take the leadership in providing full-time career development specialists to all school systems, in conjunction with more effective joint advisory and planning committees on training and education for the work place.

I am more confident today than ever before that there is increasing evidence of meaningful dialogue, based on a realization of needs, between the corporate and educational sectors. As business becomes more specific in its requirements and critique of the educational system, the response from the system can be better targeted to meet the real needs of the work place, and its workers.

I am also convinced that although we emphasize the differences, there are numerous areas of agreement, such as a concern for all levels of student/workers, and the delivery of programs of high quality. Certainly Polaroid's experience with over two dozen educational organizations in the planning, design, and administration of significant education activities supports that conviction.

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A Post-Industrial Perspective on Improving Joint Efforts Between Education and the Employment Community

INTRODUCTION

During the seventies, the employment community's involvement in education grew as both sectors became increasingly uneasy about the problems associated with youth making the transition from the classroom to the work place.

School–industry cooperation also became more attractive during this period as a result of the private sector's shrinking profit margin and redoubling of its pursuit of more cost-effective operations through productivity improvement. Education was subjected to budget cuts in both curriculum and administration due to inflation-fed difficulties that continue to affect the operation of the nation's schools.

Therefore, youth unemployment, the decline in growth rates of productivity, the concern about the effectiveness and efficiency of school operations, along with the diminishing public confidence in education and the business community, highlighted the need to develop an "education-industrial complex," capable of addressing this situation, central to human resource development. Although both sectors increasingly are recognizing that the school-to-work process and the quality of the work force cannot improve independent of each other's efforts, they continue to conduct joint initiatives primarily, on a fragmented, duplicative, and uncoordinated basis.

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We begin the decade of the eighties with the reality of not having made significant progress in human resource development through industry-education joint efforts during the past decade. The fractionated character of contemporary school-industry cooperation, particularly in the area of youth employment, has been due, to a significant degree, to the introduction of a variety of federally supported community-based mechanisms and programs aimed at providing short-term solutions—transitional services—for the long-term problem of preparing people for productive work: a remedial rather than a preventive approach.

This paper focuses on discussing an appropriate *structure* and *process* for helping to resolve major problems in the work place, i.e., unemployment, underemployment, and misemployment. Improving joint efforts between education (academic and vocational) and the employment community (business, labor, government, and the professions) is slow, long term, and incremental in nature. There are no identifiable realistic short-term alternatives to building the base for a comprehensive industry-education alliance in preparing youth to enter the labor force.

Patience, thorough planning and evaluation, intensity of effort, and adequate resources are required on the part of the two sectors in developing and implementing relevant work-education programs. We need less rhetoric on collaboration during the eighties and a better understanding of the realities of what it takes to develop a structure and process for conducting effective industry-education joint efforts—a formidable challenge in an age of great expectations and instant solutions.

Youth unemployment is a national scandal. Redefining the problem is a useless exercise. As continuing efforts are made to formulate a national, clearly defined human resources development policy in response to this situation, this paper offers direction for establishing a holistic policy at the local level in which the employment community and education, as the major players, will be able to use their resources in the most cost-effective manner with respect to youth employment.

REINDUSTRIALIZATION AND HUMAN RESOURCE DEVELOPMENT

The framework for examining linkages between education and employing institutions has changed significantly since the early seventies. There is an increasing reference in the current literature to the relationship of school-industry cooperation applied to human resource and economic development. Until the last two years, the traditional context for linkages between the two sectors was one in which programs and activities were conducted to enhance the employability of young people and improve their understanding of our economic system.

The National Association for Industry-Education Cooperation highlighted education's role in human resources development in 1979-80 in two regional conferences in Hartford, Connecticut and Boston, Massachusetts, and at its 1980 fall national convention in Dallas, Texas, during which specific attention was directed at how industry-education joint efforts can contribute to: the quality of the labor force, productivity improvement, the reduction of structural unemployment, and a community's economic development. The National Center for Research in Vocational Education at The Ohio State University, the American Vocational Association, and the American Society for Training and Development have conducted major research initiatives and have presented policy statements on this subject in recent months.

Discussing school-industry cooperation in youth employment and the school-to-work process within the framework of human resource development recognizes that education represents the primary delivery system to the labor market and needs a mechanism that wires the schools and industry together for productive work. "Schools, therefore, directly affect the size and quality of the work force at the local level, a key factor in a community's economic development. Other factors include the availability of natural resources, quality of technology, and the amount of, character and rate of accumulation of capital" (Clark 1979). Education in most localities is "the biggest game in town," and in performing its function as the major human resource delivery system to the marketplace, it has a major role to play with the employment community in the development of an area's economic base.

Education has been viewed as one aspect of human resource policy. "At the present, inflation and unemployment, declining growth of productivity, work time, the presumed demise of the work ethic, the growth of the welfare state and discrimination in the labor market are all relevant to any discussion of human resource policy" (Levitan 1981, p. 273). However, implementing a comprehensive, articulated career and vocational program jointly with the employment community offers a realistic, *preventive*, long-term solution to falling productivity, structural unemployment, and to changing technology requiring a highly skilled work force.

Linked with the employment community, the schools can make a more significant contribution to the development of human resource policy for improving youth employment.

The administration's priority assigned to reindustrialization or the revitalization of the American economy based on supply-side economics takes into account the need "to improve the productive quality of the American work force, expedite its integration with applied technologies and increase the rapidity with which we respond to the changing relative prices between the other factors of production" (Carnevale 1981). Dr. Pat Choate, senior economic policy analyst with TRW, Inc., reinforced this point, noting that "improving the quality of the labor force is the principle route to increased national productivity, particularly in the coming decade when capital will become scarce and the technology of many other nations will be comparable to ours" (Choate 1981).

Whatever industrial remodeling must be done to achieve revitalization of our economy, the priority issue for the eighties is raising the rate of productivity growth. This will require an education and training services infrastructure in the development of human capital—one which wires the schools and employment community together for long-term joint efforts.

An education-industrial complex designed to improve human resource development requires both sectors to participate cooperatively in developing a comprehensive education-work program for youth, using a systems approach, to include joint planning in establishing goals and objectives, curriculum development, and program evaluation. A structure, such as an industry-education council, combines the resources of the schools and employment community to create an environment for learning, which encompasses and builds on the strengths of both systems.

In examining the process of bringing education and work into better alignment, one must recognize that "there are no fixed parameters as to what constitutes school exit or work entry" (Ferris and Arbeiter 1975, p. 98). Successful linkage requires that schools and colleges examine their processes and exit requirements, and that the work sector likewise examine itself and its human resource requirements in light of what is being produced by education, as a baseline for cooperative planning and arrangements. These two almost completely separate aggregations of semi-independent bureaucracies cannot achieve a smooth and efficient transition from school to the work place simply by "communicating" with each other. They need to commit and integrate their resources within a permanent structure in an organized and systematic manner with knowledgeable leadership in order to redirect education in meeting employer and prospective employee needs.

EMPLOYMENT PROGRAM POLICY

Programs to alleviate youth unemployment are usually referred to under the following two categories:

1. There is the short-run option that attempts to create jobs. The intent of such an option is to provide youthful workers with experience and income.
2. There is the long-term option that emphasizes a change in the education and training process so that the outcome is youth with much better preparation for entry into the world of work (Jurman 1981, p. 75).

The job creation approach calls for establishing a new market for youthful workers largely composed of government employment opportunities. Billions of dollars have been allocated to programs that are, primarily, short term in nature, lack the mechanisms for successful planning and implementation, are not cost-effective, and are conducted with little, if any, thought given to the relationship among them. Job creation is a component of federal employment program policy. "The U.S. government expenditures on youth employment are between 10 and 20 billion dollars a year At the same time, current government expenditures on school curricula and instructional improvement are 10 to 20 *million* dollars per year" (Abt 1979, p. 23). Further, during the 1970s, over 99 percent of the public investment in youth employment has been made outside the schools.

A review of federal employment program policy for youth and adults reveals an effort to solve several incompatible problems simultaneously. Federal employment policy has been remedial in nature, supporting programs that are generally improperly designed and maintained to deal with those individuals who have difficulties in seeking, getting, and holding a job. Federal job training programs have not been directed "to knowledges and skills that relate to productive employment as assessed through real knowledge of the work place" (Lincoln 1981). There has never been a coherent federal jobs program since the Great Depression.

The emphasis prior to the Comprehensive Employment and Training Act (CETA) was on provision of income support and work-experience programs and short-term training for placement in entry-level jobs without thought of long-term career development. The CETA record is not much better; it reveals no substantial progress in human resource development services.

CETA represents "a program of multiple purposes and as such suffers from fragmentation of purpose" (Mori 1980, p. 190). Rarely does CETA public service employment offer anything but a temporary job. However, for youth, acquiring decision-making and personal coping skills, career planning, job-search training, and realistic work experience in real jobs is a major developmental need that generally has not been met within the remedial programs of CETA.

Efforts to establish linkages between CETA and education have encountered formidable problems. Vocational educators, in particular, have always had a less than comfortable relationship with the U.S. Department of Labor. They feel that they have valuable experience in skill training and development that should be utilized, and that to ignore this resource leads to duplication and the possibility of the establishment of a dual system of education. Many CETA prime sponsors contend that vocational educators have failed to meet the needs of CETA's client population, and that new and more effective delivery systems must be developed.

"Vocational educators express concern that many CETA programs are ineffective, based on political expediency, and often lead to dead-end training for dead-end jobs" (Lund 1976, p. 15). CETA personnel, however, assert that vocational educators are unresponsive to the job market.

Educators, in general, were unlikely to become involved in CETA's early development because many of them viewed CETA with indifference or antipathy. Some have considered the human resource development functions of CETA programs as unrelated to the main concerns of schools or have dismissed CETA programs as belonging to the domains of institutions other than schools. Some "have been repelled by the political entanglements that too often accompany participation in CETA programs (Morris 1980, p. 614).

Perhaps the most significant issue concerns the awarding of academic credit by school systems for work experience under CETA, a practice that many educators view as devaluing academic credit and drawing away from instruction in basic skills those who most need such instruction. From the schools' perspective, the eligibility criteria, which are issued by CETA, do not always correspond well with individual needs for educational service.

A 1981 U.S. Department of Education report, *Manpower–Education Coordination: Two Decades of Frustration*, pointed out that only superficial improvements have been made in linking and job training programs, and there was little reason to expect more success in the future. Different business cycles, fragmented employment and training programs, and the absence of strong coordinating mechanisms will continue to thwart joint activities between education programs and CETA, according to the report.

Employment program policy related to youth employment needs to be reviewed in a discussion on establishing linkages between education and work. Efforts to establish cooperative planning and arrangements involving schools and work under short-run options such as the Youth Employment and Demonstration Project Act of 1977 and other programs associated with CETA have not, in the aggregate, been productive in attacking the youth unemployment problem.

Federal employment program policy is designed to train individuals for "jobs"—that is, paid activities. The long-term option for youth employment focuses on preparation for *work*, a conscious effort "aimed at producing benefits for oneself and/or for oneself and others" (Hoyt 1981, p. 4). Work includes paid employment; however, it takes into account the role of career education provided by the schools at all grade levels in which individuals have opportunities to acquire and utilize the knowledge, skills, and attitudes necessary for each to make work a meaningful, productive, and satisfying part of their way of living. The National Commission for Employment Policy (1979), in its report on *Expanding Employment Opportunities for Disadvantaged Youth*, recommends that "youth unemployment should be viewed principally as a structural problem and long-term solutions sought"—such as career education.

The Vice President's Task Force on Youth Employment reinforced this long-term approach in its 1980 *Summary Report on the Private Sector/Education Roundtables*, in which both large and small employers recommended that career education be provided at every grade level, along with real work experience for all high school students through short-term vocational explorations, work–study jobs, and internships. The representatives from seventy-seven major corporations agreed in roundtable discussions that they wanted to work with the school system to improve the quality and options of local graduates.

Youth employment can be made economically attractive to employers by increasing youth work productivity. This requires investment in human resource development through increased and improved general education, work-related attitudes, and vocational skills. "No politically feasible subsidy is going to persuade a significant percentage of employers to employ youths they do not consider desirable because they have inadequate basic skills or poor work attitudes and behavior" (Abt 1979, p. 12). As we enter the eighties, in economically uncertain times and with stagflation, employers are likely to pursue conservative hiring policies for high-quality high school graduates.

For education to significantly improve youth employability over the longer term, a well-structured local human resource delivery system, developed jointly by the schools and the employment community, will be required and a recommended reallocation of federal investment from employment and training to elementary and secondary schools should be approved at a level that will enable these institutions to implement a comprehensive career and vocational education system, one designed to be responsive to the needs, in particular, of special groups.

FEDERAL INITIATIVES IN LINKING EDUCATION AND THE EMPLOYMENT COMMUNITY

Industry-education joint efforts in improving youth employability increased significantly during the seventies as a direct result of the career education movement under the leadership of the U.S. Office of Education (USOE). The demonstration projects sponsored by the Office of Career Education in USOE stimulated the participation of the employment community in public school and postsecondary work-education programs.

There was a significant growth in the development of local industry-education councils and career education advisory groups as a result of this federal initiative. Dr. Kenneth B. Hoyt, director, Division of Career Education, USOE, has recommended the formation and operation of Community Career Education Action Councils based on the following assumptions: "(1) If career education is to be a community responsibility, it is essential that some community organization be established to accept this responsibility; (2) Educators need help, not just advice, from the broader community if career education efforts are to succeed; and (3) Unless community members are given authority to make operational policies for career education, it will be difficult, if not impossible, to assure that accountability for the success, or lack of success, of career education will be shared both by the education system and the broader community (Hoyt 1979, p. 8).

Career Education Action Councils constitute an advisory group to the local board of education and operate through a wide variety of organizational patterns. The National Association for Industry-Education Cooperation (NAIEC) produced a film and handbook in 1978 on community-based career education in which the following broad program categories are discussed: staff and curriculum development, career guidance, school-based job placement services, and work experience/career exploration and evaluation (Clark 1978a).

Under the federally funded Career Education Incentive Act, designed to help those state education departments and local school systems that wish to implement career education during 1979-83, a "community partners in career education" program was developed by the U.S. Department of Education's Division of Career Education. National community organizations such as NAIEC, U.S. Chamber of Commerce, National Alliance of Business, and the AFL-CIO have been working with state department career education coordinators in broadening the base of community involvement in career education at the local level.

Efforts to link the employment community with the schools through the initiatives of the U.S. Department of Education's Division of Career Education are well documented in the department's extensive evaluation reports, monograph series, and other publications. One of the greatest contributions career education made to American education during the decade of the seventies was to serve as a vehicle for forming many and new productive linkages between the formal education system and the employment community.

In 1977, another community-based model, the work-education council, surfaced under the sponsorship of the U.S. Department of Labor (DoL). The council concept was based primarily on *The Boundless Resource*, published by the National Manpower Institute (NMI) in 1975. NMI was subsequently awarded a contract by DoL to identify a limited number of communities for the purpose of establishing a work-education council.

The Boundless Resource advocated a "new means" or new institutions to facilitate youth's transition from school to work through a work-education council. This type of community-based organization was not new nor was its impact on improving the school-to-work process significant during the past five years, according to the Abt Associates, Inc. study, *Education and Work Councils: Progress and Problems.* The "new means" for NMI's Work-Education Consortium focused on community-education linkages in the areas of counseling, occupational information, placement, career education and education-experience, and educational interchanges—previously operational through industry-education councils and career education advisory councils.

The National Institute of Education-sponsored 1980 Abt Associates phase I report (Prager et al. 1980) included an evaluation of twelve work-education councils—all part of the Work-Education Consortium Project—followed by a phase II case study approach to the progress of four councils. This initial twelve-site evaluation report cited a lack of specific goals on the part of some councils; no reference was made to institutional change; "most of the NMI staff that councils came into contact with were research and policy-oriented" (Prager et al. 1980, p. 75); (NMI, the developer of the work-education council concept, was the primary intermediary in this federally sponsored project—the National Alliance of Business and the American Association of Community and Junior Colleges were the other intermediaries); virtually all council activities were short term in nature; and many councils suffered a sense of being a solution in search of a problem.

The report concluded that many council members had not developed a sense of mission or urgency as a group. This project, open-ended and with no federal design, left both the councils and intermediaries without a clear set of roles, responsibilities, and expectations. In sum, the U.S. Department of Labor supported a consortium that has had little impact on institutional change in education, that did not emphasize staff and curriculum development in its program (which are the primary requisites for effecting institutional change), and that has not introduced any major innovation beyond what was already operational in community-based organizations involved in improving the school-to-work process.

In May 1978, the Private Sector Initiative Program (PSIP) was announced by the Carter administration as a major new federal effort to improve coordination between the government's human resource development program and the private sector for the purpose of providing private sector employment opportunities for the economically disadvantaged. The new $400 million budgeted PSIP was subsequently under Title VII of the CETA reauthorization legislation enacted in October 1978. Private Industry Councils (PIC) were to serve as points of contact between the private sector and the local CETA system, with the goal of improving CETA's responsiveness to the needs of the business community by matching job skills of trainees to those required by employers, determining labor market needs, and devising training programs to meet those needs.

Education's participation in the PICs was encouraged; yet, a clear role was not formulated for the schools, the major human resource delivery system to the labor market. The schools, in general, have not been systematically involved in PIC planning. Further, PICs, in many instances, were established in areas where the private sector previously had been directly participating in career development and training activities with such advisory groups as industry-education councils, vocational education advisory committees, and career education advisory groups.

The business community has continually expressed interest in joint efforts with education in human resource development; with the advent of the PICs, the private sector was invited to forge a "lasting partnership" with the federal government in pursuing "the major goal of assuring that all workers receive the training and work experience necessary to obtain stable unsubsidized employment" (U.S. Dept. of Labor 1979, p. 3). This is not the first time the private sector has been asked to take responsibility and provide leadership in helping the economically disadvantaged gain employment. Previous programs include the National Alliance of Business Job Opportunities in the Business Sector (JOBS), the Skills Training Improvement Program (STIP), and others. Some have been voluntary projects; others have provided incentives for business involvement.

The business community's response to participating in programs addressing youth and adult hard-core unemployed has been characterized as follows:

> The evidence is clear that the private sector has rarely been interested in providing training and job opportunities for the hard-core structurally unemployed. The private sector approach is necessary, but neither volunteerism nor incentives from government are sufficient. The administration's current Private Sector Initiative Program is like "trying to leverage with a toothpick" (Kazis and Sabones 1980, p. 7).

Federal youth and adult employment and training initiatives have never really pleased the private sector. The Vice President's Task Force on Youth Employment reinforced the private sector's preference to work with education in improving the employability of youth because of their institutional longevity and permanency, the perception that schools are a basic community institution that ought to serve all school children, and residual credibility of school systems programs.

At this point Private Industry Councils are not making a significant difference in CETA job training programs, according to an assessment of the PSIP by the Public/Private Ventures organization. The central finding of the study is that:

> In terms of programs, participants, outcomes, and institutional evaluation, PICs have not yet moved to become distinctive entities within the overall nexus of CETA programming activity (Public/Private Ventures 1981, p. 20).

Educational institutions with their long-term experience in school-industry joint efforts, vocational training, basic skills, career education, occupational planning, and job placement in preparing youth and adults for work—all components of the PSIP mission—are accorded minimal participation in the federal employment and training program as members of the PICs.

In the Public/Private Ventures report, the point is made that programs have been designed and supported by PICs that are rather familiar to students of employment training programs. Likewise, the Abt Associates evaluation study reveals that work-education councils have developed projects that are not, in general, innovative to industry-education cooperation practitioners. The industry-education council mechanism designed exclusively to assist schools in the development of relevant curricula and meet both employer and prospective employee needs offers the most realistic *structure* to achieve short- and long-term results in human resource development.

IMPROVING THE EMPLOYABILITY OF YOUTH THROUGH INDUSTRY-EDUCATION COUNCILS

In a public policy report, *Industry-Education Coordinator,* published by the National Association of Manufacturers in 1971, the need for improved linkages between education and the employment community was described as follows:

> Today, the problems pressing education, industry, and the nation require a new alignment—new procedures—between industry and schools. Businessmen want a closer working relationship with the schools. Farsighted businessmen and educators have already resolved the questions of motives and confidence.

> They have moved to the pragmatic question of how business can help more effectively (National Association of Manufacturers 1971, p. 5).

Other statements in the early seventies reflected a similar theme. In the book, *Volunteer Industry Involvement in Public Education*, Dr. Leon M. Lessinger and Samuel M. Burt stated:

> The most important and pervasive single reason for industry volunteer involvement in public education is industry's concern for an assured supply of well educated and properly trained manpower. Industry sees the schools as the major institution in our society where all of its future manpower can be reached with relative ease. Thus, whatever consumer, economic, occupational, or career message industry desires to provide the youth of our nation, the schools and school staff are viewed as the intermediary agency between industry and youth (Burt and Lessinger 1970, p. 3).

Industry-education joint efforts, however, required implementation through a cost-effective *structure* and a *process* that would help bring the work place and the schools into better alignment, thereby facilitating youth's transition from the classroom to productive employment. Existing education-work linkages at the beginning of the last decade continued to be conducted on a fragmented, independent, and duplicative basis; an umbrella bringing together all volunteer resources within a community, therefore, became a priority.

The industry-education council (IEC) model was a response to the need for a coordinated school-community effort. "Industry" represents the business/labor/government/professional community, and constitutes the local power structure in this advisory group working with the schools. The chamber of commerce plays a key role in the organization and operation of an IEC. As a *structure* for linking the work place and education, "it mobilizes the key resources of a community, develops plans for their efficient allocation, and provides a greater opportunity to achieve program objectives" (National Association for Industry-Education Cooperation 1972, p. 3).

The "council pursues a long-term commitment to assisting schools in the *process* of initiating staff and curriculum development, occupational information delivery systems, school-based job placement, work experience/career exploration, and cost-effective educational management practices" (Clark 1981).

The primary emphasis with respect to long-term implementation of a comprehensive school-to-work program is on intensive and continuing inservice training (staff development) linking academic and vocational faculty, administrators, guidance counselors, and librarians/media specialists in a team effort at all levels in education. An industry-education council plays a major role in the development of inservice training, which provides professional staff with needed skills and materials in such areas as career/economic education, job placement, and occupational information systems.

Staff development is essential to curriculum change within the total school program, and provides a multiplier effect in reaching students. The industry-education council model generally includes the range of programs and activities of a career education advisory council. Industry-education councils are unique among all community-based organizations involved in education-work linkage activities in that their sole mission is to stimulate and help effect change in the total school program. They are designed to improve the transition from the classroom to the work place.

The school district, primarily, is the base for a typical IEC function, with linkages to postsecondary institutions, CETA prime sponsors, and other human resource development/employment agencies. This comprehensive industry-education structure is underwritten, for the most part, by education, with business/labor/government/professional community support in terms of volunteer resources, i.e., personnel, facilities, and some financial support where appropriate.

Vocational education advisory committees, in their work related to occupational surveys, verification of course content, and support for proposed legislation, should consider a close working relationship with industry-education councils. A council's experience in occupational information systems, curriculum construction, professional staff development, and job placement can contribute to the effectiveness of a local vocational education program (Clark 1978b, p. 11).

Industry-education councils are operational throughout the nation in such states as New York, Michigan, Ohio, Georgia, Illinois, Wisconsin, Utah, Arizona, and California. The National Association for Industry-Education Cooperation views the establishment of local industry-education councils as playing a major role in upgrading the quality of an area's labor force. Its publication, *Industry-Education Councils: A Handbook*, developed in cooperation with the National Association of Manufacturers (NAM), suggests guidelines for organizing a council, proposes several types of cooperative activities, and provides examples of statements of purpose used by existing councils. The NAM and NAIEC consider the appointment of an industry-education coordinator in each state a first step in achieving full potential for cooperation. New Jersey, for example, established this function as early as 1958.

Industry-education councils, linking the work place with public schools and postsecondary institutions, have been pursuing a long-term incremental effort in refocusing education in ways designed to help individuals acquire employability skills and develop attitudes as preparation for paid and unpaid work. This type of community organization, therefore, represents a realistic and synergistic cost-effective *structure* and *process* in human resource development.

INDUSTRY-EDUCATION COORDINATION IN OCCUPATIONAL PLANNING AND OTHER WORK-RELATED ARRANGEMENTS

Change is the hallmark of today, and the work place is no exception. "Over the next decade, we can anticipate significant changes impacting on the employment situation for youth that will require major adjustments in educational programs focusing on the school-to-work process" (Clark 1976, p. 183).

The nature of employment in the eighties will be affected by major technological changes; occupational changes reflected in the transition from a goods-producing to a service economy; geographical mobility of industries; educational/income/population changes; and variations in the composition of the labor force, e.g., the steady increase in the number of women entering the work place. These changes affecting the contours of the work place must be considered in occupational planning associated with school and employment and training programs in preparing youth for entry into a national labor market.

Those involved in occupational planning require a delivery system capable of providing local, regional, and national data (i.e., basic information) on how many jobs are open now and what skills they call for, as well as the projected job and skill needs for a reasonable period in the future.

"The United States is one of the few major industrial nations in the world that does not have a national system for reporting job vacancies" (Striner 1981, p. 27). We have no real sense of the true supply/demand equation in occupational planning, which is essential in preparing youth for work and meeting employer needs.

The occupational data provided by state labor departments, for example, do not reflect a large enough sample of employers in a standard metropolitan statistical area (SMSA) needed for occupational planning purposes or use in career development activities. At the national level, the National Occupational Information Coordinating Committee (NOICC) has a basic mandate to make sense of the various occupational data produced by the federal government and to help states deliver useful standardized information to citizens on the projected supply and demand for specific jobs. NOICC has awarded grants to a limited number of State Occupational Information Coordinating Committees (SOICCs) to encourage and aid in the development of Statewide Career Information Delivery Systems to give special attention to labor market information for youth. Neither the NOICC nor SOICC initiatives have had a significant aggregate impact on national, state, or local occupational planning, and expectations of meeting the planning needs of employment and training and vocational education programs are minimal in the near future.

Industry and the schools should consider, at this time, developing an economic and employment profile of a SMSA—one that educational planners, employers, human resource analysts, economists, and others can utilize for occupational planning, vocational education programming and for instruction, guidance, career exploration, career preparation, and placement purposes. An industry-education council can serve as a catalyst for data on an area's past economic performance, trends in occupations in the goods-producing and service industries sectors, the relationship of population employment and income to the local economy, perspectives on the local unemployment problem, and long-term prospects for an area's economic development. Chambers of commerce, economic development agencies, postsecondary urban economists, and DoL economists, for example, are primary sources of data.

An economic and employment profile would also include a macro overview of the previously cited changes in the national labor market, along with national and state economic and employment trends that serve as a baseline for comparison purposes with a SMSA's situation. The profile offers a realistic base for the development of an occupational information delivery system, one capable of disseminating supply/demand data within a short period of time at a relatively low cost.

Occupational planning is a priority for the schools and industry due to the overriding concern of both sectors in producing an adequate number of trained people to serve the needs of the economy. An economic and employment profile represents an important linkage project that meets this need.

There is a wide variety of other cooperative arrangements—*processes* —linking education and work. Samuel M. Burt, in his manual, *Strengthening Volunteer Industry Service to Public Education,* describes industry-education joint efforts within the framework of upgrading professional staff, improving instructional programs, helping students, and improving public relations. Cooperative arrangements in similar categories are described in the literature. A few examples of successful, well-established education-work linkages or cooperative arrangements are as follows:

1. In Salt Lake City, Utah, the schools, working with more than eleven hundred firms and agencies with employees of over 140 different occupations, conduct a comprehensive work-education program that features classroom speakers, plant and office tours and discussions, onsite observations of workers (shadowing), and student internships offering part-time, unpaid work experience for school credits. The Business-Industry Community Education Partnership (BICEP), a community-based group, organizes and coordinates these cooperative activities.
2. The Rochester, New York Area Career Education Council has a strong staff development emphasis in its program, which includes educator internships in industry, graduate work-education related courses, and plant visits. A community resource directory and career planning guide are among the materials produced by the Council.
3. In Akron, Ohio, the public schools have engaged in a wide variety of industry-education cooperative projects during the past ten years: inservice training in career education, an adopt-a-school program, career exploration, and job placement. Business, education, labor, government, and community organizations' representatives, working through advisory groups, develop and implement this comprehensive Akron school-to-work program.
4. The Arizona Business-Industry-Education Council, Inc., has been offering programs throughout several cities in the state for over fifteen years. Staff development programs provide educators with business exposure and experience, and industry conducts classroom

presentations, sponsors visits to employment sites, and disseminates occupational information to students, primarily at the secondary school level.

5. In Madison, Wisconsin, the Business and Education Coordinating Council sponsors the Business-Education Interaction Experience, Summer Business and Society Seminar, and other projects for local professional school staff, featuring topics on business operations, economic issues such as productivity and labor relations, and improving the school-to-work process. Students participate in career development and career decision-making activities coordinated by the Council.
6. The Business Task Force in Dallas, Texas, which is the education committee of this city's chamber of commerce, worked closely with the public school system in spearheading the building of the Skyline Center, completed in 1971, which represents both a regular comprehensive high school and a special career development center. The program offers students training in major job clusters and receives guidance in each cluster from a chamber of commerce committee of local business people. In 1976, the Community Network for Public Education was established and organized into eight task forces. It serves as an umbrella for all community groups working to improve the school program for Dallas students.
7. The Colorado Communities for Business and Education Interaction is the coordinating agency for a network of thirty-four local business-education councils that sponsor projects such as community resource centers, career fairs, work-study programs, and inservice training for teachers, counselors, and administrators. A state education department-operated community resource bank disseminates information to school districts, agencies, and individuals on the availability of field trips, classroom speakers, internships, and curriculum assistance.

These cooperative arrangements highlight the function of an industry-education structure in which the employment community *directly participates* in the *process* of staff and curriculum development and other work-related projects in an organized, systematic manner. Successful long-term comprehensive school-industry joint efforts require an effective working relationship between vocational education and a career education-oriented academic program. The Association of New York State Industry-Education Councils, the Industry-Education Council of California, and the previously cited organizations in Arizona and Colorado serve as a statewide umbrella, linking agent, and catalyst for identifying and implementing cooperative programs and practices aimed at improving youth employment at the state, regional, or local level.

A STATE-OF-THE-ART SUMMARY OF EDUCATION-EMPLOYMENT COMMUNITY JOINT EFFORTS

Former Education Secretary Shirley M. Hufstedler, in a summer 1980 speech before the National Alliance of Business in Washington, D.C., called on business to collaborate with education at the local level. She said, "Neither schools nor corporations can continue the business-as-usual pattern in which the private sector lives exclusively in its own world and educators live in theirs. We need each other, and we can help each other" (Hufstedler 1980).

This has been a recurring theme over the past thirty years. There are also other familiar statements that surface today about the suspicion, lack of communication, and other barriers between the two sectors. Breakfast and luncheon gatherings attended by education and industry representatives continue to highlight school dropout rates, youth unemployment statistics, and students lacking basic and employability skills and an understanding of our economic system. Calls for "collaboration" are heard from those who, in some instances, are unable to define the term.

In other words, whereas attention to and interest in improved coordination between schools and the employment community has increased, particularly during the past decade, the aggregate impact of cooperative efforts of these systems in improving the preparation of students for the world of work—measured in terms of significant results—has been minimal. One can make the case in the disaggregate that a specific work-related "demonstration project" or "innovative program" has been successful with a limited group of students.

Bringing an educational system into alignment with the work palce to facilitate youth's transition to productive employment cannot be accomplished, however, without curriculum revision, a professional staff with the skills needed to infuse world-of-work concepts into classroom instruction at all grade levels, experience-based career decision and exploration opportunities for all students, and a community districtwide mechanism that helps schools plan and implement a comprehensive work-oriented program. This requires a far greater commitment by education and industry than undertaking another "demonstration project."

Current industry-education joint efforts continue to be conducted, for the most part, on a fragmented, duplicative, uncoordinated, and ad hoc basis, against the backdrop of the rhetoric calling for improved linkage between the two sectors. Employers and the schools must recognize that a *structure* is the focal point for productive education–work linkages. "Getting organized" at the local level is the starting point for short- and long-term cooperative arrangements.

Field trips, resource persons in the classroom, career days, and job placement are useful as work-related activities in schools. Junior Achievement, 4-H clubs, Girl Scouts of the United States of America, and Boy Scouts of America, for example, offer excellent programs that include career-oriented experiences for youth. However, these programs, projects, and activities, taken together, are not the primary vehicles for bringing about change in the school program. They serve as part of a community support system in improving the school-to-work process and could be more effectively utilized when coordinated under a systemwide umbrella such as an industry–education council.

It is conceivable that all of the following community-based organizations involved in youth employment could be present in a local area: an industry–education council, a vocational education advisory committee, a career education advisory council, a private industry council, and a work-education council. CETA and the U.S. Department of Labor-sponsored advisory councils have only complicated the situation at the community level.

One of the U.S. Office of Education's efforts at improving cooperation between industry and the schools during the seventies was the creation of an industry–education–labor (I–E–L) coordinator position. Beyond the rhetoric, a few planning conferences, a limited study on I–E–L cooperation, and the dissemination of a roster of state-designated I–E–L coordinators, this function of USOE's Bureau of Occupational and Adult Education was a token response to the need for educational leadership at the national level.

These and other developments in recent years support the conclusion that "business–industry–education activities in the U.S. are fragmented and uncoordinated" (The National School Public Relations Association 1980, p. 10).

RECOMMENDATIONS

Throughout this discussion, the focal point has been on the need for a cost-effective structure and process for improving industry-education joint efforts applied to human resource development, primarily in the area of youth employment. The final step in this paper is to suggest some "next steps" in strengthening work-education linkages, which should help to sort out some of the assumptions, expectations, and realities with respect to this subject:

1. Schools are the best and most equitable institutional form for educating and training youth for productive employment. As such, they will require a significantly broader base of corporate support in the eighties in the form of volunteer resources (i.e., personnel, facilities, experiences) to improve education's capability in preparing youth for work.
2. Effective work-education linkages require active "participation" and "integration" of resources on the part of both sectors rather than the traditional rhetoric calling for "communication" and "collaboration."
3. If industry expects youth to enter the work force with basic skills, productive work attitudes, general scientific knowledge, communication skills, and work experience, it needs to redirect an appropriate level of its foundation support from establishing chairs of private enterprise, economic education projects, and short-term work-related activities that serve a limited audience, to elementary and secondary education initiatives designed to help all youth develop the attitudes and acquire those skills expected when entering the work place.
4. Both education and industry must recognize that continuing and intensive school staff development is essential to implementing curriculum change. Unfortunately, "educational leaders have given it little or no attention, and no one in education has done much about it neither" (Howe 1980, p. 1).
5. The schools should provide the primary financial support for an industry-education coordination function within the local system, one which serves the entire school program, and take the initiative in organizing an industry-education council to help plan and implement a comprehensive program in preparing youth for work, beginning at the elementary school level.

6. State legislatures should view economic development as a top priority. The quality of the work force (human resources) plays a major role in attracting industry to an area. Legislation should be enacted appropriating funds to a state education department for activities designed to help expand and improve the quality of local industry-education coordination to enhance the schools' capability in human resource development, particularly in preparing youth for work. In a report, *The New York State Economy in the 1980s: A Program for Economic Growth*, New York's governor cited the need to maintain an enterprising, well-trained labor force to keep pace with the demands of a changing economy and to establish councils composed of representatives of business, labor, government, and the educational system, to ensure the coordination of career education programs with the changing needs of society (Governor's Office of Development and Planning 1981).
7. This nation needs to establish a consistent employment policy. We have a history of multifocused, confused, and replaceable programs—stopgap "solutions" to preparing youth and adults for work.
8. A large fraction of the public investment in CETA and employment-related wage and tax subsidies might be more productively spent on improving formal schooling—academic and vocational.
9. Further research is needed to determine what works and does not work in developing linkages between education and the employment community, and what refinements are necessary in the delivery system for youth employment.

Improvements in the educational system are imperative so that all youth who exit from our schools are employable and self-sufficient. A comprehensive school-to-work program will go a long way in eliminating the need for federal job programs like those under CETA.

The employment community working with the schools can help meet the human resource requirements of the eighties. The potential for effective long-term linkages is there. The problem is that it has always been there, yet ignored.

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DAVID W. STEVENS

19

Job Training in Business and Industry—Reactor Comments

The purpose of this Forum is to provide policymakers with information that will enable them to make more informed decisions about various training systems. The three themes of this session are to (1) identify special strengths of business training opportunities, (2) explore coordination issues involving the business community and other sources of skill development, and (3) examine the business sector as a vehicle for training disadvantaged youth.

My basic reaction to each of the papers presented is that they only scratch the surface in addressing the conference themes. There are two fundamentally different views about organizational behavior. One school of thought sees organizations behaving in a top-down, goal-oriented manner; one in which it is assumed everyone is attempting to achieve the same objective(s). A second view rejects this linear notion and argues that goal displacement occurs at various points, resulting in organizational survival being the only identifiable common objective. The views expressed in the papers that have just been summarized are more consistent with the institutional survival approach than with the goal-oriented view. The remainder of my comments address the question, What difference does it make which of these views is accepted as the better description of training in the business sector?

It has been argued that organizational planning should be a priority consideration for organizations, and that the potential for improvement in this area has always been there. What evidence supports the assertion that planning skill development is a priority target? And, if the potential for improvement has always been there, why hasn't this potential been acted upon? In fact, my reading of the evidence leads me to conclude that personnel activities occur with such a degree of independence (i.e., isolation from the production process) that the first statement is incorrect, and the second begs the question of why the potential for improvement has not been acted upon.

It has been stated that a better alignment between schools and industry is needed. Toward what end? What advantages are there to be realized through enhanced coordination? In answering this question, it is incumbent upon the respondent to also state why the respective parties have not recognized this advantage themselves: Why is external intervention necessary to promote allegedly advantageous actions? Of course, there are plausible explanations for such a need, but they have not been introduced in the papers presented here. I will return to this issue in a moment.

It has been stated that schools are, for the most part, not required to show that their training accomplishes anything. If so, why aren't they held accountable? And, what does this suggest about the potential for improved coordination between schools and industry? Schools' precision in planning far outstrips refinement of performance measurement, yet the former is practically meaningless without the latter. Why fine-tune the distribution of entrants into the training system across occupational skill categories, if the contribution of this fine-tuning to productivity enhancement is not going to be monitored with equal precision?

Permit me to sketch an outline of the skill development process, which addresses the forum themes more directly than have the papers presented here this morning. An individual's embodied ability to accomplish a specific task is only one of many factors that will determine employment opportunity, work stability, and compensation. Frequently, there are multiple ways in which a specific task competency can be achieved. In many cases, task accomplishment requires interdependent actions taken by more than one individual. And, from the employer's perspective, there may be multiple ways in which a specific production process can be organized.

Collectively, the observations stated in the preceding paragraph amount to this: Individual competency to perform is only one determinant of opportunity, and it can be acquired in various ways, must sometimes be combined with other people's contributions to accomplish an assigned task, and is subject to employer discretion in combining human and capital resources to produce goods or services. In other words, the contribution of one individual's skill to that person's own employment outlook, or to the economy's productivity, is difficult to isolate. This means that terms such as "skill requirements," "occupational shortages," and "structural mismatches" are fraught with interpretive pitfalls.

The importance of these observations in this Forum is that they highlight the absence of simple uniformities upon which we can easily base generalizations about the propriety of investing in better coordination between public and private sources of skill development. Many sectors of our economy are characterized by important shelter characteristics; i.e., institutional features that limit the extent to which immediate economic forces are quickly translated into management actions. These shelters exist in the form of collective bargaining provisions, firm and industry composition, stability of demand, and tax laws, among other attributes that could be mentioned. These shelter characteristics help us understand why employers differ in their own provision of training opportunities, to whom these opportunities are made available, and under what circumstances cooperation with public institutions is observed. I heard no mention of this consideration in the papers just presented.

The business sector does offer one potential advantage in skill development for women and minority youth, to the extent that learning occurs coincident with actual production at some stage of the training program. This advantage lies in the simultaneity of control over both training and the job being trained for. However, by focusing on this characteristic, I am not appealing to the traditional observation that public institutions are unable to offer state-of-the-art equipment and instruction. I look instead at the willingness to date of most public education institutions to focus on access of women and minority members into nontraditional classroom activities, with relatively little attention being given to their subsequent labor market success. And, by success I do not mean training-related placement. Placement is a transaction, with no direct effect on individual well-being. What matters is the transformation of productive potential into actual productive contribution and, presumably, higher earnings. At least in the business sector, learning and production as joint outputs ensure some access to actual job experience. Of course, to the extent that vestibule training occurs as an activity independent of production, and with no promise of access to it, there may be little difference between the public and private sectors in their relative attractiveness to females and minority youth.

Finally, I conclude with an observation that is tangential to this particular session, but is fundamental to the theme of the Forum: We stand on the threshold of serious proposals to decentralize the education and employment and training functions in our economy to a much greater extent than now exists. One consequence of such a transformation would be an increased likelihood that successful achievements in one setting would remain unknown to others who might benefit from an awareness of the experience. There are, of course, individuals and organizations who stand ready to package and sell such information, so the information imperfection may be short-lived. However, the costs of duplicative marketing of this type are likely to exceed what could be achieved through a clearinghouse function, in which developmental costs are incurred only once.

Job Training in Proprietary Schools

DOROTHY KILE CANN

20

Proprietary Vocational Schools: An Alternative Education Lifestyle for the Disenchanted/Disadvantaged

The stated purpose of the Forum for which this paper was prepared "is to provide policymakers with information that will enable them to make more informed decisions about various training systems."

As in the classroom, the most effective way to provide your students with information is first to get their attention. Consequently, it is not the purpose of this paper to present statistical information or additional data about the proprietary school industry or its students. Where examples are used to clarify a point, they are minimal and selective. Many other similar ones could be listed as well. Those interested in research studies and descriptive literature on the industry are referred to the bibliography.

The perspective of this paper is not that of a researcher or other outside party interested in statistical examination of proprietary vocational education. It is the perspective of an active vocational educator, a participant in the proprietary system, who believes that system to be not only a major educational source but also a significant contributor to the nation's economy.

What is the proprietary vocational system? How does it work? Why does it work and grow? What is the "alternative educational lifestyle" we offer? Why does it appeal to the "nonstudent" student, to those who have become disenchanted with traditional institutions and are therefore "educationally disadvantaged"?

In the educational service business, in the proprietary vocational education system, many of our clients are among those who are disenchanted with the traditional educational system. We cater to them and to the job market. That is our approach. It is how we are different. It is the reason we are successful and growing. It is the reason we should have the attention of the policymakers.

Historically, proprietary schools predate not only public vocational schools but all public schools. Our origin was in Plymouth Colony in 1635 when a local master of accounts started to teach the "casting of accounts." He was paid for his teaching, and it became his business. He became the first proprietary vocational school owner.

True, a European apprenticeship system developed and still exists in some trades in this country today. True also that the European type of educational institution, aimed at general education and the teaching of the classics, developed in this country and still exists today, operating both publicly and privately. But neither of these systems has completely filled the need for the skilled labor necessary for the country's constantly growing and changing commercial and industrial job markets. Either because the training systems took too long, or because they failed to respond to industry's needs, there has always been a place on the American educational scene for the proprietary vocational school.

Other craftspersons in other fields opened schools and became business persons. Business persons opened trade schools and became vocational educators. Course materials were not patterned after European schools or philosophy. The subject matter was taught for itself and only related disciplines were incorporated into the course. There was perhaps not time, or need, to educate the vocational student in the "classics." There was a definite need to put the trained and skilled laborer to work as soon as possible.

The growth of these schools from the Colonial period has never stopped. The U.S. Commissioner of Education in 1898 reported there were 123,193 Americans enrolled in vocational courses, of which 70,950 were attending proprietary schools.

How are we doing today? S. M. Jung (1980) gives a breakdown of the types of schools now operating and shows over 1 million students in attendance at nearly 6,000 schools in 1978 (see table 20-1). It is reported that proprietaries enroll over 3 million students per year, with gross

TABLE 20-1

Number of Noncollegiate Postsecondary Schools with Occupational Programs by Type and Control of Schools: United States and Outlying Areas, 1978

Type of School	*Total*	*Public*	*Private*		
			Total	*Proprietary*	*Nonprofit*
1	*2*	*3*	*4*	*5*	*6*
Total	7,625	812	6,813	5,814	999
Vocational/technical	606	504	102	76	26
Technical institute	99	7	92	83	9
Business/office	1,249	4	1,245	1,201	44
Cosmetology/barber	2,163	0	2,163	2,162	1
Flight	1,064	5	1,059	1,055	4
Trade	716	14	702	616	86
Arts/design	246	0	246	220	26
Hospital	917	147	770	18	752
Allied health	355	114	241	195	46
Other	210	17	193	188	5

SOURCE: National Center for Education Statistics, 1978.

annual revenues of at least 2.5 billion dollars (Eisenberg 1973)—and we are expanding in enrollments every year. When the recession and the end of the baby boom seriously affected colleges, our schools experienced an increase in enrollments. *U.S. News and World Report* ("Young People" 1980) even suggested that the recession was partially responsible for increasing enrollments in proprietary schools.

> Private schools that train people for jobs from machinists to milliners are enjoying a resurgence, helped along by the nation's rising unemployment rate.
>
> Once scorned by some educators as second-class institutions, profit-making trade schools have registered a 25 percent increase in students during the last two years. . . .
>
> The reason for the surge is that hundreds of thousands of young adults are spruning colleges for training that can assure them of high-demand careers, a head start in on-the-job experience and beginning salaries that are often higher than those of college graduates. (p. 78)

In addition to experiencing expanding enrollments, proprietary schools are uniting to help each other with common concerns and to combat the image of "second-class institutions" referred to in the *U.S. News and World Report* article. As an educational sector, we have started to recognize each other and are building strong state and national associations. We have accrediting agencies and have developed sophisticated structures to examine ourselves in terms of the quality of our educational programs and our conformance to the standards and goals we have set. According to Jung (1980), proprietary schools have adopted the traditional accreditation process practiced by the major regional accreditation agencies that have shaped educational quality standards and monitored quality in the collegiate sectors (p. 7). These agencies are recognized by the U.S. Department of Education as official accrediting bodies. Their recognition allows accredited schools to participate in the postsecondary federal student financial aid programs.

The three major accrediting bodies are based in Washington, D.C. and are basically divided among three subject training areas, viz., trade and technical—National Association of Trade and Technical Schools (NATTS); business—Association of Independent Colleges and Schools (AICS); and cosmetology—National Accrediting Commission of Cosmetology Arts and Sciences (NACCAS). Their founding has contributed greatly to the increased recognition of the contributions of the proprietary sector.

What has kept us alive and growing? In a nutshell, sensitivity. The most important question to the private vocational school industry is "where are the jobs?" Yesteryear saw schools for horseshoe-making; today, for welding in plastics; and tomorrow, in solar panel repair. When the need for a course dies, so does the course or the school. Whatever makes financial sense—automatic accountability is the result. Some call this supply-side education. This sensitivity continues on to our students, an issue which we will address later on in the paper.

What are characteristics of the proprietary vocational school? Although the category includes a number of schools that are "not-for-profit", so-called for a variety of reasons, most of the proprietaries are, or attempt to be, profit-making businesses. Even though they offer a product (their training programs) and a service (their placement assistance programs), it is still considered by many to be reprehensible to expect a profit from an educational undertaking. What they do not realize is that some schools never see a profit. Most see minimal ones. The New York State Education

Department states that the average profit margin reported by the schools in that state is only 6 percent. To make a profit is a good sign because according to Wellford Wilms (1974) of the University of California, if they make money, they survive, and the school's income is related to how well its graduates do in the market place.

These schools may be single-owner proprietorships (the old "Mom and Pop" schools), partnerships, corporations, or corporate subsidiaries. In this day and age, proprietorships are few and far between, existing mostly as small cosmetology or other specialty schools, and partnerships are not common. Most schools have been incorporated. Some major companies, such as ITT, Bell & Howell, Control Data, and Airco (a subsidiary of the British Oxygen Company) have established chains of schools, which they operate as successful subsidiaries.

We are small, for the most part, small in size of plant, with fewer students and fewer courses of study. The twenty-nine proprietaries studied by Wilms (1974) ranged from 14 to 2,300 students, but the typical proprietary school has 250 to 300 students. Regardless of size, we share a common denominator: responsiveness to the market place and job placement needs.

Consequently, course content is another factor that sets us apart. We do not teach subjects unrelated to the field of training. That is unique. But another element of our schools' appeal is the courses themselves. Bartending, diving, barbering, tool and die design, medical office management—these courses are usually not found at your local public institutions. *The Handbook of Trade and Technical Careers and Training* published by the National Association of Trade and Technical Schools (1981) lists ninety-eight trade areas, to say nothing of the business, commercial, and cosmetology opportunities.

Our values are unique. We are educators, yes, most definitely. However, our interest is weighed in the product as much as in the method. Our values reflect this. Our teachers, for example, differ from those in high schools or colleges. Our criteria for teacher selection are more heavily weighted toward their work background and their craftsmanship than their teaching experience or their academic credentials. They generally do not receive tenure, but are constantly evaluated in terms of their achievement of student satisfaction and graduate employability. We want our students to be work oriented throughout their training. My own personal philosophy in hiring teaching staff is: "Give me a craftsman who loves the trade. Combine that with a likeable personality and a good talker and I have a budding teacher on my hands." With in-house and other teacher training programs, we can train individuals in the educational methods and mold them into successful teachers. The extra benefits they bring—the love and respect for the trade, the years of experience in the working world—are as valuable as the technical curriculum and are not shared by a pure academician.

What of the educational structure? We have already mentioned the variety of course content and its direct relationship to the job market. Our courses are also generally shorter, often taking less than half the time required for similar course titles offered in public institutions—and, as the Wilms (1974) study found, at no expense to the effectiveness of training or job placement. There is strong emphasis on hands-on, practical training activities, evaluated against a set of performance objectives derived from task lists considered important to successful performance in the field, taught by experienced tradespeople. Kincaid and Podesta (1966) in their *Exploratory Survey of Proprietary Vocational Schools* found that "Practical course materials, which also influence the length of a course, were among the principal reasons cited by students for attending proprietary schools in California" (p. 212).

Most proprietary schools employ the clock hour as the measurement of attendance and, coupled with the proof of attained skills described previously, as a sign of successful course completion. The students go to school for five, six, or seven hours per day, as they will later go to work for seven or eight hours per day. Further, we schedule these hours to meet student needs, around the clock if the demand is there. Almost 50 percent of our students are working while attending school (National Center for Education Statistics 1981, p. 210). The Tulsa Welding School, in Tulsa, Oklahoma, schedules courses from midnight to 8 a.m.

William A. Goddard, executive director of NATTS, is quoted in *Getting Skilled* (1980) as stating the following for the proprietary school success formula:

> Private schools offer success on the students' terms, not the professor's. Very few people go to our schools because Mom and Dad want them to. The student makes the decision. What the student feels in attending one of our schools is that he or she will finish quicker, get more specialized training and less training unrelated to the occupational goal. Plus, he or she will be attend-

> ing school with motivated people with similar goals. They will find the cost is less because they will be on a payroll earlier and they will find that the proprietary school is much more interested in the individual student's success because the private school has no alternative. The school's ultimate success depends on the student's ultimate success. (p. 45)

That is what we mean when we say we are sensitive not only to the market place and to the availability of jobs, but also to the student's needs.

Proprietary schools sell their placement services to potential students. In order to provide superior placement services, proprietary schools must maintain continuous contact with potential employers, tailor their programs to available job openings, and teach students how to seek and hold jobs. Most students select schools because of their high placement record.

With that overview of the structure and operational methods of the proprietary system, let us look at some of the similarities and differences between it and other occupational training systems.

Because of differences between secondary and postsecondary vocational education, comparisons of proprietary schools with vocational high schools may not be appropriate. The extent to which vocational high schools are effective in preparing students for direct entry into the labor market, without a subsequent period of on-the-job training, is questionable. Perhaps their real function, which they now widely serve, is as a feeder system for postsecondary vocational institutions. Many proprietary vocational schools have found them to be an excellent source for student recruitment.

Because private vocational school programs operate largely at the postsecondary level, the most obvious comparison and the greatest similarity, in purpose if not in method, is with the public postsecondary vocational system—the community colleges and four-year institutions offering occupational programs. When we describe our "alternative lifestyle" —smaller plant, fewer course offerings, fewer students, more flexible schedules, less unrelated subject matter—the use of the comparative form is usually with reference to conditions in public postsecondary vocational programs.

But it is not only the public postsecondary school or the community college for which we offer our alternative. We serve as an adjunct to the apprenticeship system and to big business training programs. Neither on-the-job training (OJT) in business and industry nor apprenticeship programs have provided sufficient sources of skilled labor. As Lewis B. Mayhew (1974), professor of education at Stanford University, wrote in *Higher Education for Occupations:*

> Careful observers of the apprenticeship system judge it generally inadequate to prepare the large number of skilled workers which the technological society demands. Trade unions limit the number of apprentices accepted, in part to protect job equities of their members. Employers frequently restrict apprenticeships on the ground that it is more efficient to pay overtime to experienced workers than to pay low wages to less experienced and less effective apprentices. Another alternative is to expect business and industry to provide extensive educational programs. . . . other studies, however, do not corroborate these opinions. They discover that only larger firms operate formally organized education and training programs, and that these are more frequently for managerial and professional employees than for technical or skills level workers. (p. 44)

In some ways, the apprenticeship system is much like the proprietary vocational system, with its emphasis on hands-on training and a work-oriented atmosphere. But this country never really developed an equivalent to the traditional European apprenticeship system, where the thirteen-year-old child served under a master or worked in a shop part of the time while continuing schooling as well. This meant that the individual's occupational direction was established at a young age, and there was little opportunity to change it at a later date.

The laborers and tradespeople who immigrated to this country rejected that pattern. They wanted "something better" for access to the professions and the white-collar world. The concept of the "master craftsman" was lost and for that and other reasons, the apprenticeship system in this country was limited and unable to fulfill the need for trained workers.

Not only the apprenticeship system, but the public vocational education system was rejected as well. The vocational high school was long considered the dumping ground for those who were intellectually inferior or behaviorally nonconformist. The failure of these two systems to develop in this country left a vacuum in occupational training that the private vocational system has filled. This observation was confirmed by a group of school owners touring vocational schools in Europe in 1980 where the two systems are intact and functioning and there is no private vocational school system.

We all know what the result has been—a glut of college graduates with various liberal arts or professional degrees and a shortage of mechanics and technicians. Now that trend is reversing itself. The last ten years have seen increasing attention to occupational training aimed at preparation for the types of jobs that are available or foreseen, with world-of-work and occupational orientation (career education) programs introduced early in the educational process. The public vocational high school, once shunned, has become, in many large cities, the sought-after institution, with waiting lists for admissions and selection criteria that used to be applied only for the more desirable, academic high schools. Outside the large cities, area vocational high schools have multiplied and many states have developed supplemental occupational training facilities such as New York State's Board of Cooperative Educational Services (BOCES). In the view of some experts, the growth and increasing recognition of the effectiveness of the proprietary vocational education system have been major influences in this change of attitude toward occupational training.

Inevitably, the comparisons of proprietary schools and postsecondary vocational programs raise questions of competition. In his paper, William L. Bowden (1981) reviews the comments of some researchers in the field:

> Wilms (1973) found no basis for competition in his comparison of public and proprietary students in 50 schools in four cities. He found that proprietaries served high school and college dropouts and minorities who were able students but for a variety of reasons were not able to function efficiently in the residential higher institution.
>
> Mayhew (1974) doubts that competition will evolve. He feels each group of institutions will continue to pursue its respective missions and that curriculum change in each will not clash. Houle (1972), in his analysis of institutional design, appears to discount competition. He points out that leadership is not inclined to rush into change and program confrontations that might create negative reactions among the supporting con-

> stituencies. Esdale and Tucker (1973) conclude that proprietaries have such unique characteristics in their approaches to occupational education for the marketplace that they and the traditionals are too unlike in mission and method to be competitive.
>
> In the instance of individual home study or correspondence education institutions, Coyne and Hebert (1972) conclude that the proprietary institutions represented by the National Home Study Council and the university-based divisions of independent studies represented by the National University Extension Association serve different clienteles which have different goals. The former specialize mostly in technical, occupational full career development courses, and the latter in individual academic courses designed to fit campus-based degree programs. Coyne and Hebert conclude that competition in correspondence programs between proprietaries and traditionals is not a reality.
>
> Troutt (1972) suggests ten sources of new students that would require traditionals to revise their degree formats. In reality, Troutt's sources may not be very productive markets for traditionals inasmuch as persons in the circumstances he cites habitually turn to proprietaries by choice or by necessity. Troutt's list is: adults who want occupational training; able college dropouts who still want degrees; adults with financial restraints; persons who want special programs; persons seeking job-advancement training; employees in companies that support work-related training; adults seeking relevant career change; and adults wanting courses for practical or self-enrichment use. (p. 4)

Interestingly enough, in the nearly ten years since those predictions were made, some significant changes have occurred that prove them to have been less than clairvoyant. In the first instance, a number of proprietary schools have decided to lengthen their courses by adding the additional general subjects required in order to offer associate of occupational studies or other "two-year" associate degrees. In some cases this has meant limiting their enrollment to high school graduates or instituting remedial or equivalency programs. Often, their certificate programs will serve as an additional feeder system into the degree programs, or enrollees, once in, may find either the general subject matter not to their liking, or the degree program too lengthy, and therefore opt for the shorter certificate program. Most of these schools still retain the same methods and goals: job-market-oriented programs, year-round operation, frequent starting classes, clock-hour attendance (converted into semester or quarter hour credits) and hands-on, practical training. Where both certificate and degree programs are offered, additional flexibility in meeting student needs has been achieved. Although these schools remain an important part of the proprietary vocational education system, they are probably no longer "typical" of the industry as we have described it.

On the other hand, because of political pressures and minority lobbying, perhaps in the press to maintain student enrollments and undoubtedly for other reasons, many community colleges have instituted open admissions policies, dropping the requirement for high school graduation and, in addition, implementing shorter occupational certificate courses not unlike those offered in the typical proprietary school. Whether they will be as effective in fulfilling the requirements of this role—close employer/school relationships, quick response to job-market needs, flexible responses to divergent student needs, active and effective graduate placement—remains to be seen.

Even though there are differences of purpose and method, perhaps even limited competition, between the educational systems reporting to this Forum, there have also been areas of cooperation. Private vocational schools have performed training under contract with business, with industry, with apprentice training programs, and with the military. Many of them were training vendors under the old Manpower Development and Training Act (MDTA) and more recently under the Comprehensive Employment and Training Act (CETA) or Training Rehabilitation Act (TRA) funding from the U.S. Department of Labor.

Bowden (1981), in addition to the views on competition, lists a number of different kinds of cooperative efforts between private and public vocational institutions. He also refers to concern on the part of USED for "the modest support of proprietaries" and legislative attempts to include proprietaries in educational support systems and overall educational planning, such as the "1202" commissions. Gould (1973) suggests that "the traditionalist and non-traditionalist are not adversaries; they are partners in the single grand enterprise of promoting learning" (p. 15).

Unfortunately, this feeling of partnership has not quite reached into the private vocational sector. Its members do not yet see themselves as full partners in the "grand enterprise," either in the sharing of support programs or in the responsibility of planning for the future.

For example, the New York State Education Department, in its "Futuring" program designed to set the limitations and determine the direction of all future occupational training in the state, has appointed 141 people to serve on various policy and program development committees. Thirty-nine are from business or industry, which is appropriate enough. There is but one representative from proprietary vocational education.

State tuition assistance funds are often limited to degree-granting institutions. In some cases, students at business schools are also eligible. Trade/technical and cosmetology students are often excluded. Bowden (1981) says the impact on proprietaries of the Vocational Education Act of 1963 was marginal. The proprietaries would be the first to agree that legislative attempts to mandate their participation have been stymied in the process of bureaucratic implementation.

These difficulties in gaining recognition and participation from a traditionalist-biased bureaucracy are discussed at this point because of their impact on efforts by the proprietary system to enter into cooperative training activities or programs. The same is true of linkage arrangements. There are some good cases of linkages working well between proprietary vocational and traditional academic institutions (e.g., between Paier School of Art, Connecticut, and Yale University). But linkage is still difficult to arrange.

At Apex Technical School in New York, we realized that a number of our graduates, after a successful experience with the alternative lifestyle, had rekindled their educational fires and were going on to pursue associate or other degrees. It seemed that a linkage arrangement with one or more of the many academic institutions in the city would provide a valuable additional service to our students, increase our flexibility and their career options, and at the same time, provide the participating college with a new source of students. Even with the aid of a nationally recognized consultant on linkage, we were unable to overcome the barriers raised by the various academic institutions, including City University of New York (CUNY).

Some months later, CUNY representatives visited the school to evaluate the program, Related Instruction for Stationary Engineer Apprentices, which we had been teaching on contract with the International Union of Operating Engineers for eighteen years. A labor union was able to establish a transfer of credit arrangement, which an accredited educational institution could not.

The majority of our students, however, are not interested in a return to the traditional educational atmosphere. They have become disenchanted with it. The signs of this are numerous, even if the reasons for it remain unclear. High school dropout rates are a serious problem all over this country. In some urban areas, the number of ninth graders entering high school who fail to receive diplomas is approaching 50 percent. Open admissions at the community colleges simply offer these students a return to a system they rejected in high school. As one student put it, "it was high school with ashtrays."

In spite of open-admissions practices, remedial programs, and lower or free tuition, these disenchanted—and therefore at least educationally disadvantaged—young people are turning in increasing numbers to the proprietary vocational schools as the avenue to the world of work and fulfillment of their career aspirations. The disenchantment and educational deprivation are not limited to the high school dropout, either. The high school diploma itself has become suspect. As one leading educator put it, it really only signifies that the student was institutionalized for twelve years ("Today's High School" 1981, p. 53). When Bill Goddard, as quoted earlier, said that "very few people go to our schools because Mom and Dad want them to," it was undoubtedly true, but in 1981 the "very few" has probably become a more significant number. Parents, too, have come to recognize and appreciate the shorter path to the world of work for their children.

The increasing interest on the part of young people has caused some changes and adaptations for many of our schools. Historically, we have been primarily institutions for adult education. Those who are disenchanted with traditional educational methods enter our schools to join those who are disenchanted with the place relegated to them by a technological society because they have no skills. Discontented with their lot, or finding themselves first on the layoff roster, they seek out our schools as the fastest route to reentry into the job market. Those in need of training or retraining want it now.

What should the upper age limits be? When does the ability to "benefit from the training" end? I don't know. A few years ago, my school received a letter from a student expressing appreciation for the training received and regretfully requesting a leave of absence because, at the age of seventy-three, his health was not good. Previously unaware that such a student had been enrolled, we gave him a full refund of tuition and declared a policy of automatic scholarships for anyone over the age of seventy.

These are our students: the disenchanted, the disadvantaged, the strivers of all ages Attempts to describe them statistically or in terms of demographics, ethnicity, socioeconomic status, previous educational achievement, or other measures have failed to provide a definitive picture. What they have in common is the desire for a marketable skill.

Some comment on the economic significance of the private vocational school industry is probably appropriate in this paper. It is said that in education there are tax-eating institutions, tax-avoiding institutions, and tax-paying institutions.

If Eisenberg's figure of $2.5 billion in revenues for private vocational schools was accurate in 1973, it has probably been doubled by inflation and further increased by our continuing growth. Proprietary schools have benefitted from student-based federal assistance programs such as Basic Educational Opportunity Grants (BEOG) and Federally Insured Student Loans (FISL). These federal programs partially explain the continuing enrollment increase in proprietary schools. With its small business, free-enterprise base, the industry is obviously an important contributor to the gross national product of the United States. To the extent that those revenues do, in fact, provide for a margin of profit, the industry is also an important contributor to the tax coffers of government. This cannot be said for any other system of education or vocational training.

An economic factor, which probably cannot be measured, lies in our success as a major supplier of skilled labor to business and industry. Trade and industrial training attracts the largest number of our students. Distributive and office occupations are, respectively, the second and third largest areas of enrollment. The impact of this is two-sided. On the one hand it raises the question: what would the impact be, in costs to industry or government, or to the economy as a whole, if this source of labor supply were not there? On the other side of the coin: how can you measure the economic impact resulting from the removal of our graduates from public welfare rolls, from prison rosters, from drug or alcohol rehabilitation programs, and from other costs that are not incurred because they have become independent, tax-paying contributors to the nation's economy?

Today, the nation's economic troubles of inflation and unemployment are primary targets for the Reagan administration. Education and training of the unemployed are keys to resolving these ills.

As educators, we have a part to play in the macroeconomic planning for the country. Many of our unemployed are unemployed not due to lack of jobs, but due to lack of the skills necessary for the jobs available. *The New York Times* and papers across the country carry pages of want ads every day. In spite of this fact the unemployment rate grows. One reason for the paradox is that we, the educators, have not provided sufficient education in the skills that are needed for today's jobs. Proprietary schools are only filling some of the new need. There are many potential vocational students numbered among the unemployed. This should truly be looked upon as a cry for more vocational schools. And we, the educators, collectively should welcome and respond to this need.

The broad economic picture has driven students to our schools in more ways than one. Milton Freidman is a promulgator of the concept that, contrary to protecting unskilled labor, the minimum wage laws have hurt these workers. Businesses can no longer afford to take the unskilled and train them on the job. The $3.35 minimum wage demands that the individual provide the productivity of an already trained worker. Freidman responds that this has drastically limited on-the-job training. The unskilled must find their training elsewhere.

Another noted economist, Edwin Mansfield (1980), believes that training is an important element in capping inflation. He states:

> An important factor that can reduce the inflation rate corresponding to a given unemployment rate is education or training. As more and more of the labor force is trained and equipped with relevant and basic skills, there is less upward pressure on wages at any level of unemployment. An important reason why wages are pushed upward as unemployment falls is that the economy tends to run out of skilled workers, so that poorly educated and untrained workers constitute a large percentage of the unemployed. When aggregate demand gets strong enough to absorb these workers, production costs begin rising and other workers experience so strong a demand that they are able to push up their wages. Thus it follows that programs to train the labor force, particularly the unemployed, will reduce the rate of increase of wages associated with a given level of unemployment. (p. 385)

To summarize: the request for this paper suggested that it should address the various strengths of the proprietary system for developing job skills for different types of youths. We feel that our strength lies in our sensitivity to youths' needs and our responsiveness to their interests by providing short courses that are trade oriented, exclude extraneous material, provide instant access through frequent starting dates, and that offer flexible teaching schedules to match their available time, a work-oriented atmosphere, and heavy emphasis on job placement.

A subsidiary theme that was to be addressed was the coordination among the different training systems and the world of work. We have emphasized our relationships to the world of work and our sensitivity and responsiveness to the changes in the job market, which are requisite to our continued existence. We have seen that some progress has been made in coordination among the educational sectors, but that many barriers remain to full and equal partnership.

Another theme to be addressed by the paper was the special contribution the training system makes in preparing disadvantaged youths with the job skills that are necessary for successful participation in the work force. We feel that our special contribution is in the offering of an alternative training lifestyle to those who have become disenchanted with traditional educational systems or with their lot in life and that the appeal of this life-style is not limited to youth but is felt by the disenchanted/disadvantaged of any age.

Further, we were asked to present recommendations for improving the proprietary vocational education system. We would make the following recommendations to researchers, to those who are responsible for generating educational policy, and to those who are responsible for implementing it:

1. Continue efforts to diagnose the reasons for and to effect the changes necessary to reverse the degeneration of our public school system. This is outside the bailiwick of the proprietary school industry, but it has a strong impact upon us. Our disenchanted students come to us with impaired abilities and attitudes, which we must remedy or change. Fully prepared enrollees will be easier to place and will have a broader informational base from which to progress in their chosen field. This must be a matter of major concern for all partners in the educational system.

2. Sponsor additional studies of the private trade school student. Attempts have been made to describe our students in various ways, but none of the studies I have seen can really answer the question: Why did the student come here instead of going there? What is the motivation or what are the circumstances that lead to enrollment in a private trade school? We have our dropouts, too. Where did the realities of our system fail to match the enrollee's expectations and aspirations? Further, why does a trade school experience often lead students back into the academic atmosphere they once rejected? Answers to these questions can show us ways to improve our effectiveness.
3. Sponsor comparative cost-effectiveness studies that take into account all real costs—taxes, profits, supplementary services, bureaucratic infrastructures, regulatory and credentialing activities, and so forth. Accurate information on cost-effectiveness is necessary for policy decisions that are fiscally sound and economically wise. This can only lead to improvement of the delivery systems for all vocational education and improvement of our own system as well.
4. Continue strengthening of our self-regulating associations and accrediting commissions through strong public relations programs aimed at informing the public, as well as the educational community, of our standards, goals, and accomplishments.
5. Encourage recognition on the part of policymakers, and in their plans for vocational education, of proprietary schools' contributions to the nation's economy. Familiarity does not necessarily breed contempt. It may also breed respect. It is time to explode the myth that terms such as "degree-granting," "public-funded," and "nonprofit" automatically indicate competence and trustworthiness, whereas "proprietary" and "profit motive" automatically imply chicanery.

Marvin Feldman (1981) of the Fashion Institute of Technology in New York wrote a paper for the National Center for Research in Vocational Education not too long ago in which he gave a very good description of three domains of the arts. I believe the description can be extended to education as well.

> We have historically divided the arts to which we educate people into three separate domains: the practical arts, the liberal arts, and the fine arts.
>
> All three are, in their way, liberating. All of them

> free us from enslaving limitations. All of them enlarge us, although in different ways.
>
> The practical arts are the arts of function. Their mastery provides independence from degrading toil. Their conscientious pursuit has enduring, intrinsic value.
>
> The liberal arts are the arts of meaning. Their mastery provides a sense of purpose, or relationship, of order. They free us from the anxiety of alienation. They help us know the full range of human possibilities, and guide our restless efforts to perfect our institutions.
>
> The fine arts are the arts of transcendence. Their mastery provides a sense of depth, of mystery and majesty. They remind us that we can create more than we can comprehend. They free us from the anxiety of limitation. (p. 9)

We in the proprietary sector of vocational education recognize the value of a liberal arts education and are as concerned with effective general education programs as any other members of the educational community. We appreciate the joys of creativity and freedom from limitation. But our specialty is training in the practical arts. We are good at it, but our contributions to the "grand enterprise" of education will be limited by the degree to which our accomplishments are recognized and our participation is sought.

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JEROME MOSS, JR.

21

Job Training in Proprietary Schools—Reactor Comments

The purpose of this Forum is to seek implications for policy decisions about the usefulness of various employment-related education and training systems. I therefore found myself reading Dorothy Cann's paper with these questions uppermost in mind:

1. What are proprietary schools?
2. How does the training they provide differ from other systems?
3. What strengths and limitations are inherent in those differences?

I had no trouble locating or inferring Cann's answers to these questions. What made the reading particularly interesting is that I found myself challenging some of her answers.

Let me commence with a clear agreement. She and I *are* talking about the same set of institutions when we use the term "proprietary schools."

Where we begin to disagree is in our perceptions of the *essential differences* between the characteristics of proprietary schools and the characteristics of other job training systems. The paper implies that proprietary schools comprise the *only* system whose curriculums are based upon an analysis of occupational requirements, whose students receive realistic, hands-on practical experiences with their progress evaluated in terms of ability to perform the occupational tasks, and whose instructors are selected because of their occupational rather than their academic competence. I suppose that there are some public postsecondary vocational programs that do not have those same characteristics, but I submit that they are atypical rather than typical. And, indeed, those atypical programs are most likely to be located in four-year institutions and in community colleges where the occupations dealt with are likely to be different from those most frequently taught in proprietary schools. Most significantly, however, the paper ignores the 600 postsecondary publicly supported, nondegree-granting technical institutes and vocational/technical schools throughout the country that have the same program characteristics and that cater to students with the same educationally relevant characteristics as proprietary schools. It is not the curriculum development process, the teaching methods, the means for student evaluation, the students, or the teachers that make the difference. But when the paper points to greater sensitivity to the job market (including offering programs not found in the public schools), and sharply focused content resulting in shorter courses than in the public system as important distinguishing characteristics of proprietary schools, then it *is* getting close to the heart of the matter.

I believe the strength of proprietary schools is their ability to meet the test of the marketplace.* They attract students and place them in related jobs, otherwise the schools would not make a profit, stay in business, or pay taxes. The reason they can meet the test of the marketplace is that they are highly selective about what they teach, the occupations for which they train, and the content included in the curriculums. They teach only what they can make a profit on (or, in not-for-profit schools, what they can break even on).

However, the characteristics that make proprietary schools viable and successful are the very source of their limitations. (These are limitations the paper does not acknowledge.) Proprietary schools cannot run at a financial loss. Consequently, they cannot serve all people or satisfy all of society's needs for occupational training requiring less than a college degree. Specifically, I suggest that proprietary schools have at least three limitations that are significant for policymakers.

First, they cannot provide programs unless the labor market demand is large enough, there are sufficient numbers of students interested, and the cost of instruction (both capital and labor) is small enough to permit operating at a profit. This means that the range of occupations for which training can be provided, and the number of clients whose occupational interests can be satisfied, are limited. It means that, because of the population density required, access to proprietary school programs will be restricted.

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*A careful cost analysis should be done to determine the extent to which public funds are being used to subsidize proprietary institutions, e.g., through student tuition aid.

Second, the programs of most proprietary schools will provide "training"—in the narrow sense of that term. Occupational objectives will be narrowly defined and will be focused on immediate payoffs. The courses are short, and the applications of the content taught are specific. By contrast, *some* programs should take a broader, longer-range view of vocational preparation. Greater attention should be paid to the development of the client's work-related capacities, the transfer of training to a range of occupations should be valued, and performance beyond initial entry-level positions should be of concern.

Third, private, profit-making institutions cannot bridge the gap between and cannot coordinate the resources or the activities of a variety of privately operated and publicly operated systems of employment-related education and training. There is too much competition among private institutions and systems to permit them to coordinate their activities in the long-range interests of the state. For example, the plan of a state to attract new industry, or to implement its economic development ideas through job training, cannot depend upon the sensitivity of proprietary schools to the current labor market to create the kinds of training programs needed for the future.

I, therefore, conclude that proprietary schools comprise an important component of the total set of mechanisms that should be provided for employment-related education and training. Because of their limitations, they cannot be the only component, and probably should not be considered the primary component in that set.

A corollary of the view that proprietary schools should be considered a supplemental, complementary resource is that public agencies have responsibility for working with them in order to utilize their combined resources most efficiently. Two illustrations come to mind from my own community. First, in determining the kinds of programs to be provided in its new $30 million vocational/technical school, the Minneapolis School Board has planned jointly with Dunwoody Industrial Institute (a not-for-profit school) to prevent unnecessary program duplication, so that the citizens of the area will have the widest possible set of vocational programs available to them. The second illustration involves my own Department of Vocational and Technical Education at the University of Minnesota, and Dunwoody. For over fifty years we have had an agreement under which our students (who are training to be teachers) can take technical courses at Dunwoody and receive credit toward their baccalaureate degrees, and Dunwoody's teachers can take undergraduate and graduate courses in our department. Our students pay no tuition to Dunwoody, and Dunwoody's teachers pay no tuition to the University. In the last several years, when we were planning our new vocational and technical teacher education building, it was decided early that there was no need for us to provide facilities for advanced specialty laboratory courses; our students will continue to use Dunwoody's courses in its facilities (as well as similar courses in the neighboring public vocational/technical institutes). The citizens of Minnesota are the beneficiaries.

I do not know how much deliberate, planned cooperation there is (as in my two examples) between the public and proprietary systems, or who, if anyone, typically initiates the cooperative action. But the facts seem to indicate that, by and large, the postsecondary public and private school systems are complementary. Figures recently released by the National Center for Educational Statistics and reported in the October 8, 1981 issue of *Manpower and Vocational Education Weekly* reveal that accredited public and proprietary types of schools overlap very little. The following table illustrates this fact.

TABLE 21-1

Type of School	*Public*	*Proprietary*
Vocational/Technical	591	64
Junior/Community College	905	84
College/University	260	11
Business/Commercial	3	731
Cosmetology/Barber	3	1,710
Flight School	1	712
Trade School	8	398
Art/Design	0	136
Total	1,771	3,846

These figures account for 86 percent of the total number of public postsecondary and 93 percent of the total number of proprietary schools in the nation.*

I can only conclude that a defacto cooperative arrangement may already exist.

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*Independent nonprofit schools are not included in the proprietary figures shown.